

A CMS Energy Company

September 27, 2007

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U.S. Environmental Protection Agency C-14J
77 West Jackson Blvd
Chicago, IL 60604

(Phone number 312-886-7950)

RE: KALAMAZOO RIVER SUPERFUND SITE RESPONSE TO INFORMATION REQUESTS

EPA Region 5 Records Ctr.

## Dear Ms Furey:

Enclosed, in two boxes, is the Supplemental Response One of Consumers Energy Company to EPA's information requests related to the Kalamazoo River Superfund Site. Thank you for allowing me to provide these at this date.

Responses continue to be subject to the General Objections which were made with the initial response. The supplement consists of information related to the Kalamazoo Portage Street Offices (Former Manufactured Gas Plant), the Kalamazoo Steam Plant, and the B.E. Morrow power plant.

As we discussed on the phone, I have not provided a supplement for the Mill Street Power Plant. The Company only operated that facility for 7 days. The site had been used by City of Kalamazoo since the early 1900's for an electric power plant. The City used electricity for its city street lighting system and some private customers who bought electricity from the City. The Mill Street plant was inefficient, and the Company transferred service to the Company's existing system as promptly as it could. Unfortunately, the Company sold the property to the Auto Ion Chemical Company. Auto Ion used it for the unlawful treatment and disposal of hazardous waste, and it subsequently became a Superfund site. The Company made full disclosure to EPA in connection with the Auto Ion site. Because the Company operated it for only seven days, it has no relevant information about that facility other than documents in EPA's records for the Auto Ion site. Any PCB on the premises would be most likely the result of Auto Ion's operations, with the secondary possibility that it could be from the operation of the site by the City of Kalamazoo for many years.

The Company did not locate any release of PCB to the Kalamazoo River in this review.

Please call me at 517-788-1846 or E-mail me at <u>jpdickey@cmsenergy.com</u> if you have any questions about this material.

Sincerely yours,

John P. Dickey

# CONSUMERS ENERGY COMPANY GENERAL RESPONSE TO 104(e) QUESTIONS SUPLEMENTAL RESPONSE ONE KALAMAZOO STEAM PLANT

#### J.P.Dickey

#### INFORMATION REQUESTS

1. Identify all persons consulted in the preparation of your responses to these Information Requests.

The following persons were generally consulted with respect to all facilities, in addition to persons mentioned in responses for specific facilities.

John P. Dickey, Attorney
Ronald L. Fobes, Environmental Department
Margaret J. Kaiser, Corporate Records
Matthew D. Morrissey, Environmental Department
Robert Neumann, Environmental Department
Ward J. Wilson, Environmental Department
Patrick A. Zombo, Environmental Department

All persons consulted can be reached through John P. Dickey, Esq., One Energy Plaza, Jackson, Michigan 49201, Phone (517) 788-1846, Fax (517) 788-2543 E-mail jpdickey@cmsenergy.com

2. Identify all documents consulted, examined, or referred to in the preparation of your responses to these Information Requests, and provide copies of all such documents. If, in lieu of or along with a textual response to any specific Request, you refer to a document that you believe contains information responsive to that Request, you must identify the specific location (page number, paragraph number) in the document where responsive information can be located.

See General Objections.

Exhibit Steam Plant 1: Keiser & Associates
Phase I Environmental Site Assessment
East Michigan Avenue/Former Consumers Power Site
January 10, 1997

Exhibit Steam Plant 2 Keiser & Associates
Phase II Environmental Site Assessment
E. Michigan Ave/Former Consumers Power site
June 2001

Exhibit Steam Plant 3 Malcolm Pirnie, Inc.

Site Subsurface Investigation Report June 2001

Exhibit Steam Plant 4 Soil and Material Engineers, Inc Remedial Action Plan Consumers Energy Ash Site April 3, 2003

Exhibit Steam Plant 5 Soil and Materials Engineers, Inc.

Groundwater Monitoring Report Kalamazoo Ash Consumers Energy Company February 14, 2003

Exhibit Steam Plant 6.Manifested Waste shipments from Kalamazoo Ash Site 2002

Exhibit Steam Plant 7 Drawing of site as owned by Economy Power Company 1915

Exhibit Steam Plant 8 Drawing of site as owned by Consumers Power Company 1963

3. If you have reason to believe that there may be any person able to provide a more detailed or complete response to any Information Request, or who may be able to provide additional responsive documents, identify any and all such persons.

None known

- 4. Identify and generally describe each Consumers Energy facility at or near the Site, as that term is define in Attachment 3 (Definitions). For each Consumers Energy facility, provide:
  - a. the address of the facility;

Consumers Energy has no current facilities at this location. Former facilities of Consumers Energy at this location are:

Kalamazoo Steam Plant (1911-1928) 801 East Michigan Ave. Kalamazoo, MI

Kalamazoo Heat Plant (1928-1971) 807 East Michigan Ave. Kalamazoo, MI

Kalamazoo Ash site (1911-1971) 820 Hotop/ 433 Ampersee Kalamazoo, MI b. past and present EPA ID numbers, RCRA numbers and NPDES numbers for the facility; and

Past numbers none known..

Consumers Energy has a waste generation number MIK969118562 for wastes it generates while participating in cleanup of the Kalamazoo Ash site

c. the current owner of the facility

City of Kalamazoo 415 Stockbridge Ave Kalamazoo, MI 49001-2898

5. Identify all prior owners and operators of each facility, and their dates of ownership and/or operation.

Economy Power Company Feb 1911 to August 1915 Consumers Energy (formerly Consumers Power) Company Aug 1915 to Feb 1973

# Plant Property:

D.E. Raines and G.F. White Feb 20, 1973 – Feb 4, 1974 W.C. Hopkins Jr. – Feb 4, 1974 to March 3, 1980 D.E. Raines and G.F. White March 3, 1980 to June 3, 1985 State of Michigan – Tax Reversion City of Kalamazoo – date of acquisition unknown

"Ash Storage" area

D.E. Raines and G.F. White – Feb 10, 1973 – May 28, 1981 City of Kalamazoo: May 28, 1981 to?

6. Provide copies of all local, state, and federal environmental permits ever granted for each facility or any part thereof (e.g., RCRA permits, NPDES permits, etc).

Not available.

7. For each facility, identify and describe all types of monitoring reports, monitoring data, and documentation sent to or received by federal or state regulatory authorities regarding any materials containing hazardous substances used, generated, stored, treated or disposed at or from the facility.

See Exhibits Steam Plant-1, Steam Plant-2 Steam Plant-3 Steam Plant-4, and Steam Plant-5. There are some additional monitoring reports not provided, which are merely cumulative and contain no additional information on PCB. See also, Exhibit Steam Plant 6, Manifested waste shipments, with attached manifests.

8. Identify and describe the nature of all past and current operations and production processes at each facility. Identify, if available, all current and previous SIC codes associated with each facility.

The Steam Plant produced electricity by coal combustion. SIC 4911 The Heat Plant burned coal to produce electricity and steam, which was piped to various Kalamazoo businesses for heat. SIC 4939.

The Ash area was an area where coal ash was placed from the Steam Plant and the Heat Plant.

9. Identify each product produced at the facility. Further identify the mass quantity of each product produced on an annual basis.

Products Electricity and steam – quantity produced unknown

10. Identify and describe any and all activities or efforts to take production facilities out of operation, and include the dates of each such activity or effort.

Production ceased June 2, 1971.

11. For each facility, identify and provide any data, estimates, analyses or other information regarding any material used, treated, stored or disposed that contained or may have contained PCBs. To the extent available, provide all such data, estimates, analyses or other information on an annual basis.

Consumers Energy has no information that any PCB was used, treated, stored, or disposed of at the facility. PCB was detected at one location on the premises. See response to question 39. Consumers Energy had not owned or occupied the property for 16 years at the time PCB was detected, and it is not at all clear that the PCB came from Consumers Energy operations. Other industrial users had occupied the site subsequent to Consumers Energy leaving.

12. For each facility, identify any data, estimates, analyses or other information regarding the concentration of PCBs in any material used, treated, stored or disposed there. To the extent available, provide all such data, estimates, analyses or other information on an annual basis.

None known. See response to question 11

- 13. To the extent not already provided in response to Request #11, provide the following information:
  - a. the type and quantity, on an annual basis, of any oils or other lubricants used, treated, stored or disposed at each facility that are known or suspected to have contained PCBs;

None known

b. the number, handling and disposition of all transformers and conductors at each facility; and

Unknown

c. data, analysis and other information regarding leaks, discharges or other releases from any transformer, conductor or other equipment using oils or lubricants at each facility.

None known.

14. To the extent not already provided in response to Request #12, identify any data, estimates, analyses or other information regarding the concentration of PCBs in the materials identified in your response to Request #13.

See Response to Question 11.

15. Describe the procedures used by you or anyone on your behalf to test PCB concentrations in the materials identified in your response to Requests #11 and #13, above. Include in your response test methods and dates.

See Response to Question 11.

16. Describe the procedures followed by you, or anyone on your behalf, to prevent, mitigate or address the release or threat of release of any material identified in your response to Requests #11 and #13, above.

See original response.

17. Provide a figure delineating the groundwater flow direction on your property.

See Exhibit 3, Figures 3 and 4.

18. Identify the depth(s) to groundwater at your property.

Groundwater depth is approximately 7 feet below existing grade

19. For each production process at each facility, identify and describe each waste stream from its creation to final disposition.

The principal waste stream during Consumers Energy's operations was coal ash. It is believed some ash may have been sold, and some was placed in the Kalamazoo Ash area, close to the plant.

- 20. For each facility, identify all past and present waste units (e.g., underground storage tanks, above ground storage tanks, waste piles, landfills, surface impoundments, lagoons, dry wells, septic systems, floor drains, ponds, pits, machine pits, container storage areas). For each such waste unit identified, provide the following information:
  - a. The location of all past and present waste units whether currently in operation or not.

See Exhibit Steam Plant 7 and Exhibit Steam Plant 8 and response to (b) below

b. The type of unit (e.g., underground storage tank, lagoon, dry well, etc).

Landfill – Coal storage area north of the railroad Machine Pits – "Transformer Pit" West end of the former plant building Container Storage Areas – Platform northeast of former plant building.

c. The dates that the unit was in use.

Landfill used as landfill 1911-1971. Ash removed starting in 2002 Transformer Pit – sometime during the period 1911 to 1971 Platform – sometime during the period 1911 to 1971

d. The purpose of past and/or present usage (e.g., storage, spill containment, waste disposal).

Landfill – coal ash disposal (referred to recently as Coal Ash Storage)

Transformer Pit – unknown except by name

Platform – storage of various equipment, including transformers at times

e. The quantity and type(s) of materials (e.g., manufacturing materials, wastes, hazardous substances, pollutants and contaminants) located in each unit.

Not available

f. If the unit is no longer in use, describe how was such unit closed, and what actions were taken to prevent or address potential or actual releases of waste constituents from the unit(s). Include all analytical data from such closure.

Not available

21. For each facility, identify any data, estimates, analyses or other information about the presence of PCBs in each waste stream created. To the extent available, provide such information on an annual basis.

Not available. No PCBs are known to have been included in waste streams.

22. For each facility, identify any data, estimates, analyses or other information about the concentration of PCBs in each waste stream created. To the extent available, provide such information on an annual basis.

Not available. No PCBs are known to have been included in waste streams

23. For each facility, describe the procedures used by you, your predecessor(s), or anyone on behalf of you or a predecessor, to test the PCB concentration in each waste produced, stored, treated or disposed at that facility. Include in your response test methods, media tested, and dates.

No PCB wastes are believed to have been stored, treated or disposed at the facility. No PCB waste is known to have been produced.

24. For each facility, identify each off-Site location at which wastes that contained or potentially contained PCBs were disposed. Further identify the dates of each such off-Site disposal, and the nature, quantity and PCB concentration of any such wastes.

None known.

- 25. For each facility, and for each waste produced, stored, treated or disposed at that facility:
  - a. identify the PCB concentration of any waste;

Not available. No PCBs are known to have been included in waste streams

b. if the waste contained detectable concentration of PCBs, describe each occasion on which a release of such waste occurred or threatened to occur; and

Not available. No PCBs are known to have been included in waste streams

c. describe the procedures and measures taken by you, or anyone on your behalf, to prevent, mitigate or address the release or threat of release of PCBs or other hazardous materials.

See the response to question 16. No PCBs are known to have been included in waste streams and specific responses for facilities.

26. For each release described in response to Request #25 above, describe the quantity of PCB-contaminated wastes that were released or threatened to be released, and state whether any PCBs contained in the wastes contributed to the presence, or threatened to contribute to the presence, of PCBs in the Kalamazoo River.

Not available. No PCBs are known to have been included in waste streams.

The Company has not located any releases confirmed to have contributed to the presence of PCB in the Kalamazoo River. The Company objects to the phrases "threatened to be released" and "threatened to contribute" as being vague and ambiguous.

27. For each facility, identify any data, estimates, analyses or other information about the history of flooding, or any other infiltration of water, from the Kalamazoo River.

Not available..

28. To the extent not provided in your response to Request #19, describe each wastewater stream, waste oil stream, and wastewater/waste oil mixture stream at each facility, from its creation in the production process to final discharge point. In your response include a complete description of the fate of any wastewater stream, waste oil stream, and wastewater/waste oil mixture stream produced at each facility (e.g., on-site treatment, discharge to a POTW, discharge to a storm sewer outfall, direct discharge to the Kalamazoo River).

Not available.

29. To the extent not provided in response to Requests #19 and #28, identify the quantity of all (a) wastewater, (b) waste oil, and (c) wastewater/waste oil mixture produced, on a monthly basis, from each production process at each facility.

Not available

30. To the extent not provided in response to Requests #21 and #22, identify any data, estimates, analyses or other information about the presence and/or concentration of PCBs in the wastewater, waste oil and wastewater/waste oil mixture produced from each production process at each facility. To the extent available, provide such information on a monthly basis.

Not available. No PCBs are known to have been included in waste streams.

31. For each facility, identify any data, estimates, analyses or other information regarding the effectiveness of the treatment system(s) at that facility, if any, to remove PCBs from each wastewater stream, waste oil stream and wastewater/waste oil mixture stream.

No PCB treatment facilities were identified.

32. Identify any data, estimates, analyses or other information regarding procedures and measures taken by you, or by anyone on your behalf, to prevent, mitigate or address the release or threat of release of PCBs from wastewater, waste oils, or wastewater/waste oil mixtures to the Kalamazoo River.

Not available. No PCBs are known to have been included in waste streams.

33. For any POTW identified in response to Request #28, provide, for each facility and on a monthly basis, all information regarding the amount of wastewater, waste oil and wastewater/waste oil mixture discharged to a POTW, the concentration of PCBs in the wastewater, waste oil and wastewater/waste oil mixtures discharged to the POTW from that facility and, to the extent such information is available, the PCB concentration in the effluent from the POTW.

The Company has no information about PCB concentration in material discharged to any POTW from the site or effluent from any POTW serving the site. PCBs are known to have been included in waste streams.

34. For each facility, identify each pipe, conduit, storm sewer, sewer line or other outfall that, directly or indirectly, terminates in the Kalamazoo River or its tributaries, past or present, into which treated, untreated or bypassed wastewater, waste oil, or any other waste (including wastewater/waste oil mixtures), from that facility was discharged. Include a figure identifying the source and location of each pipe, conduit, storm sewer, sewer line or other outfall.

See Exhibit 7:

10-Inch sewer to river at west end of former plant building. Warm water discharge located at the west end of the former plant building Boiler blowoff drain, located at the west end of the former plant building

For each pipe, conduit, storm sewer, sewer line or other outfall identified in your response to Request #34, identify dates of use and each outfall's source at the facility. Further provide, on a monthly basis, the volume of wastewater, waste oil or other waste (including wastewater/waste oil mixtures) discharged from the facility into each pipe, conduit, storm sewer, sewer line or other outfall.

The three discharges may have been used from 1911 to 1972. No information is available on their use thereafter Information is not available on wastes discharged, except that the warm water discharge would contain the power plant cooling water.

36. For each pipe, conduit, storm sewer, sewer line or other outfall identified in response to Request #34, identify all influent and effluent quality data. Include to the extent such information is available, the PCB concentration of all influent and effluent, on a monthly basis.

Not available. No PCBs are known to have been included in waste streams.

37. For each pipe, conduit, storm sewer, sewer line or other outfall identified in response to Request #34, identify all bypasses or spills into the Kalamazoo River or its tributaries.

None known

38. For each facility, identify any data, estimates, analyses or other information regarding the mass quantity of PCBs disposed into the Kalamazoo River as a result of wastewater, waste oil or wastewater/waste oil discharges from the production processes. To the extent available, provide such information on an annual basis.

The Company has not located any information regarding PCB being disposed into the Kalamazoo River from any such processes.

39. For each facility, identify any data, analyses or other information regarding the nature and quantity of hazardous substances, including PCBs, in the sediments, soil, groundwater, and surface water at that facility. Identify the concentration levels of PCBs for all samples collected at the facility or at any property abutting the facility.

Sediments: unknown

Soil: See Exhibit Steam Plant 2 PCB was non-detected in all but one sample.

The level was 35 ppm in soil sample SB-06 (Main Building SE)

Groundwater: See Exhibit Steam Plant 3, page 3-3. No PCB detected above drinking

water standards (0.16 ug/L detected in two samples, others non-detect).

Surface Water: unknown

Consumers Energy had not owned the property for 16 years at the time PCB was detected, and it cannot be presumed that the PCB came from Consumers Energy operations.

40. For each facility, provide information regarding any environmental response activities involving or potentially involving PCBs or PCB-containing materials conducted at that facility, or on the Kalamazoo River, its tributaries, or other abutting property, at your direction or under your control. Indicate the date(s) on which such response activity was performed, what work was performed, the expenses incurred, the results of the response activity and, if it has not concluded, when the environmental response is expected to conclude.

No known PCB response activity at this site.

41. Have you incurred any costs associated with the investigation, remediation or other action to address contamination at the Site or any portion thereof? If yes, identify all costs incurred by you through the date of this Information Request.

The Company has incurred in excess of \$1 million related to coal ash investigation, removal, reuse, and post excavation soil sampling and site monitoring for the facility.

With respect to PCB, the Company has incurred costs in reviewing the draft Remedial Investigation/Feasibility Study and other documents related to the Site, as well as in arranging for site workers to access the Company's property in various locations along the river, other than this facility. However, it has not collected information on the time spent or out-of-pocket costs at this time, and they do not relate to this specific facility.

# **EXHIBIT STEAM PLANT-1**

#### 1.0 SUMMARY

A Phase I Environmental Site Assessment has been conducted for the property identified by the City of Kalamazoo as the "East Michigan Avenue/Former Consumers Power Site" (hereinafter referred to as the "subject property" or "project site"). The subject property consists of three separate parcels specifically identified as 701 East Michigan Avenue, 820 Hotop Avenue and 433 Ampersee Avenue, Kalamazoo, Michigan. The entire project site encompassing the three parcels is irregularly-shaped, approximately 10 acres in size and currently vacant. Immediately surrounding the subject property is a mixture of residential, commercial and industrial properties including Kalamazoo Custom Metal Works, APEC, Ltd., Don Seelye Used Cars and Trucks and Dependable Heating Company. The property is bounded by the Kalamazoo River to the west, Ampersee Avenue to the east, East Michigan Avenue to the south and Hotop Avenue to the north.

The current owner of the subject property is the State of Michigan. Pursuant to a limited title search, it was noted that the State of Michigan received the subject property as a result of tax reversion in June, 1985. Historically, Consumers Power Company and its power-production predecessors owned the subject property from approximately 1910 to the early-1970's. A steam/electrical generating, coal-fueled power plant was operated on the East Michigan parcel during this period. The Hotop and Ampersee parcels were used as disposal areas for waste ash generated from the power plant.

A site reconnaissance of the subject property was conducted on December 12, 1996 by representatives of KIESER & ASSOCIATES to identify existing potential environmental concerns at the site associated with present and historical site activities. During the site reconnaissance, ash fill was noted across the entire portion of the Hotop and Ampersee parcels. Potential contaminant concerns are believed to be associated with this fill, in particular, relate to heavy metals. From the site history evaluation of the property, it was further determined that historic on-site operations likely involved the possible use, storage and/or disposal of hazardous materials on the subject property.

No underground storage tanks were noted on-site nor have any been reported or registered through regulatory agencies for the period of record. Natural gas and electric utilities, as well as municipal water and sanitary sewer service are available in the area of the subject property. Limited portions of the subject property lie within a mapped 100 or 500-year floodplain. No wetlands were noted at the site.

Based on information obtained during the course of the Phase I Environmental Site Assessment, it was concluded that historic activities associated with the subject property may have created potential on-site environmental concerns. In addition, the likelihood exists that recent activities at one adjacent off-site property may have resulted in soil and/or groundwater contamination at the project site. It was therefore concluded that a Phase II Environmental Site Assessment would be necessary in order to confirm the presence of on-site contamination which would designate the project site as a "facility" under the Part 201 of the Michigan Natural Resources and Environmental Protection Act (NREPA), P.A. 451 as amended.

Phase I Environmental Site Assessment East Michigan Avenue/Former Consumers Power Site Kalamazoo, Michigan, January 10, 1997

#### 2.0 INTRODUCTION

A Phase I Environmental Site Assessment has been completed for the subject property listed as the "East Michigan Avenue/Former Consumers Power Site." The property consists of three separate parcels identified as 701 East Michigan Avenue, 820 Hotop Avenue and 433 Ampersee Avenue, Kalamazoo, Michigan. Services are being provided to the City of Kalamazoo to identify potential environmental concerns associated with the property. The City anticipates taking ownership of the subject property for purposes of economic redevelopment. Funding for this project was provided to the City through a Site Assessment Fund grant from the Michigan Department of Environmental Quality. (Attachment A contains a copy of the Service Agreement between KIESER & ASSOCIATES and the City of Kalamazoo for this Phase I Environmental Site Assessment.)

#### 2.1 Scope of Work

The Phase I Environmental Site Assessment for the subject property is intended to provide a "due diligence" evaluation identifying the potential environmental risks and liabilities related to current or previous activities at the site. The investigation centers on readily identifiable, potential environmental impacts to soils and groundwater and the likelihood that the site serves as a source area for such impacts. This Phase I Environmental Site Assessment consists of:

- An evaluation of the site history
- A site reconnaissance survey
- A brief examination of surrounding lands
- Data evaluation and a Phase I Report

The site history evaluation examines readily available information concerning the past and present uses of the site. The primary objective is to determine whether there is a potential for on-site contamination related to previous activities. Information from aerial photographs, city directories, soil maps, regulatory agencies and discussions with property owners and local officials are used to develop the site history. The site reconnaissance survey provides a general characterization of the property and allows for visual on-site determination of potential environmental contamination or hazards associated with present conditions related to existing or past uses. The reconnaissance survey also examines on-site ecologically sensitive areas.

Off-site properties are evaluated during the inspection of surrounding lands to identify known or suspected sources of potential contamination which might impact the subject property. A review of published regulatory databases is also conducted to identify potential contaminant sources within a one-mile radius of the project site. Project information from this effort conducted for the East Michigan Avenue/Former Consumers Power Site subject property has been compiled in this Phase I Environmental Site Assessment Report. This report is designed to meet standards established by the American Society of Testing and Materials, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process" (ASTM Designation E 1527-94).

Phase I Environmental Site Assessment East Michigan Avenue/Former Consumers Power Site Kalamazoo, Michigan, January 10, 1997

#### 2.2 Limiting Conditions

This Environmental Site Assessment report was prepared as an aid in evaluating the current environmental status of the subject property. The information and conclusions presented in this report are based upon a November 27, 1996 limited Scope of Work (see Attachment A). Findings were obtained from research of the site history and a reconnaissance survey of existing site conditions. No groundwater, soil, air, radon, stormwater, surface water, drinking water, wastewater, PCB, asbestos or other samples of environmental media were collected or analyzed during the course of this project. A boundary survey of the property was not conducted and all diagrams in this report are included for illustrative purposes only. Information furnished by others and used in this report is believed to be reliable but is not guaranteed. This report is not a guarantee that contamination by hazardous materials does or does not exist on the subject property.

Possession of this report or a copy thereof does not carry with it the right to publication, nor may it be used by any but the recipients without proper citation and acknowledgement of the authors. KIESER & ASSOCIATES is not required to give testimony in court by reason of this report with reference to the property or conditions in question unless arrangements have previously been made thereof.

#### 3.0 SITE DESCRIPTION

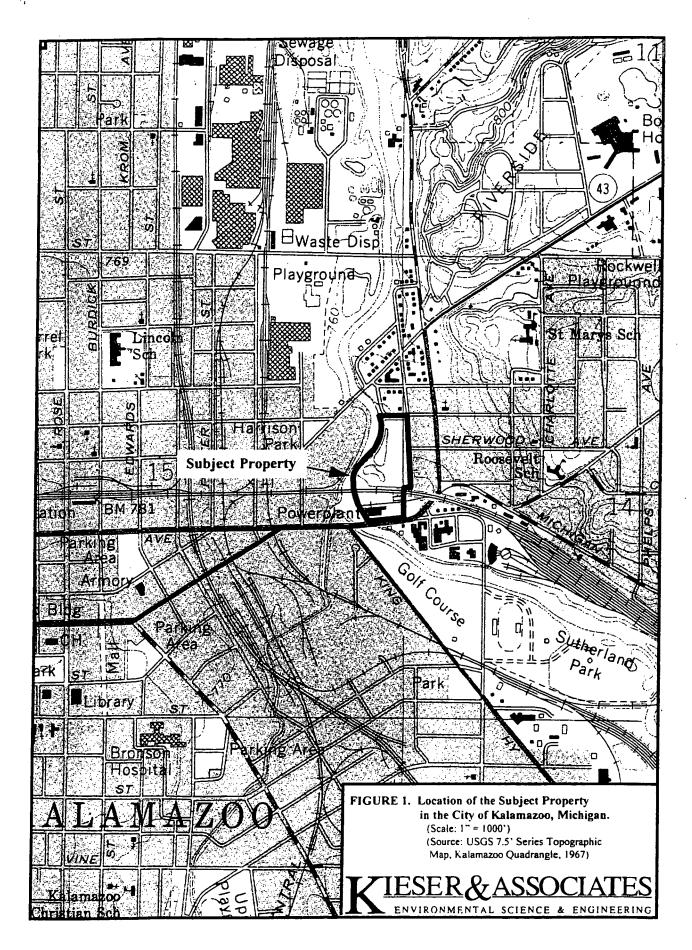
#### 3.1 Project Location

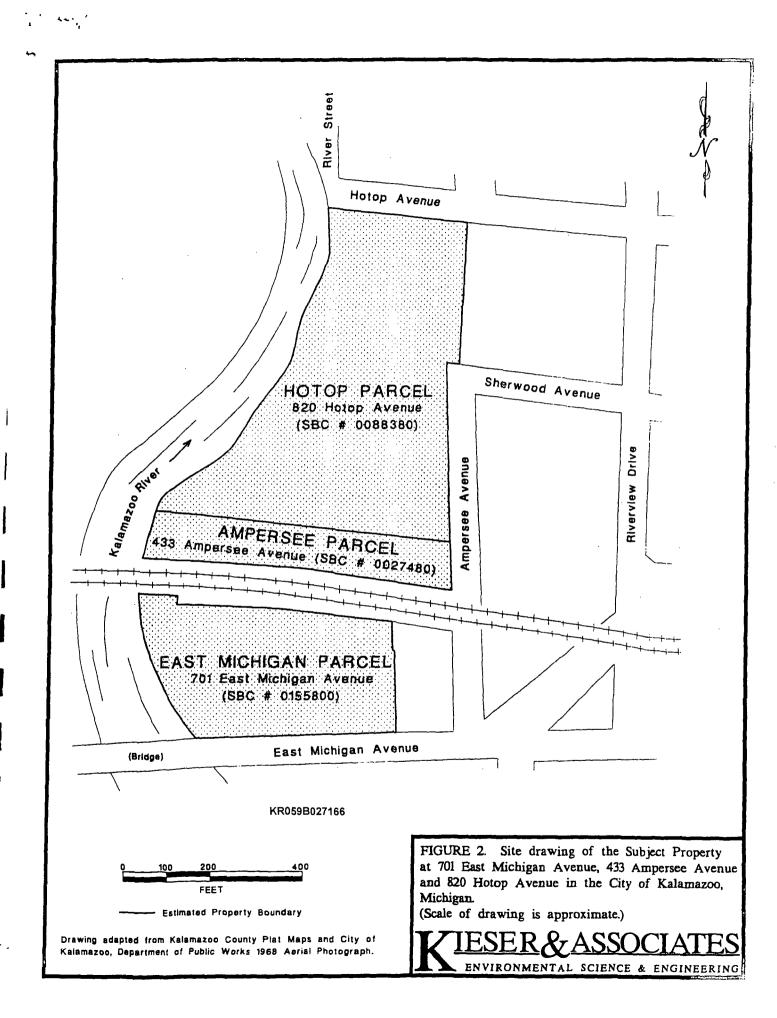
The three parcels of the subject property are located north of East Michigan Avenue, approximately 800 feet east of the intersection of Harrison Street and East Michigan Avenue along the eastern bank of the Kalamazoo River. Specifically, the property is located in Sections 14 and 15, T2S, R11W of the City of Kalamazoo, Kalamazoo County, Michigan. Access to the site from downtown Kalamazoo is via East Michigan Avenue across the East Michigan bridge spanning the Kalamazoo River. Figure 1 depicts the general project location within the City of Kalamazoo. The three separate parcels comprising the subject property are shown in Figure 2 and are referred to herein as the "East Michigan" (701 East Michigan Avenue), "Hotop" (820 Hotop Avenue) and "Ampersee" (433 Ampersee Avenue) parcels.

#### 3.2 Site Ownership

The historical owners of the subject property were confirmed through a limited title search conducted by KIESER & ASSOCIATES at the Kalamazoo County Register of Deeds Office and the City of Kalamazoo Assessor's Office. The current owner of the property is the State of Michigan. The State of Michigan received the subject property on June 3, 1985 through tax reversion from a Mr. D. E. Raines and a Mr. G. F. White (East Michigan and

Phase I Environmental Site Assessment East Michigan Avenue/Former Consumers Power Site Kalamazoo, Michigan, January 10, 1997





Hotop parcels, respectively) and the City of Kalamazoo (Ampersee parcel). (A copy of the Warranty Deed for each parcel of the subject property, plat maps and tax cards obtained from the City of Kalamazoo Assessor's Office are included in Attachment B.)

Pursuant to the limited title search and recorded deeds, the majority of the East Michigan parcel was purchased by the Economy Power Company on February 3, 1911 from a Mr. William M. Eaton. (Prior to this purchase, the property had been divided into small residential lots owned by several individuals.) (The 1912 R.L. Polk City of Kalamazoo Directory lists the Au Sable Power Company as occupying the subject property, according to the 1916 Polk directory, the occupant was referred to as the Consumers Power Company.) Additional portions of the East Michigan parcel were purchased by the Consumers Power Company in 1924. The East Michigan and Hotop parcels were purchased by Mr. Raines and Mr. White respectively from Consumers Power Company on February 10, 1973. A Mr. W. C. Hopkins, Jr. purchased the East Michigan and Ampersee parcels on February 4, 1974. Mr. Hopkins sold the East Michigan and Hotop parcels back to Mr. Raines and Mr. White, respectively on March 3, 1980. A Quit-Claim Deed dated May 28, 1981 indicates that ownership of the Ampersee parcel reverted to the City of Kalamazoo as a result of a Kalamazoo County Circuit Court judgment made on March 30, 1981.

#### 3.3 Property Description

\*\* i<sub>v</sub>

The subject property consists of three unsecured and irregular shaped parcels. These separate parcels total approximately 10 acres in size (see Figure 2). The East Michigan parcel consists primarily of an open area with exposed soils and a limited area of wooded acreage on the extreme western portion of the parcel adjacent to the Kalamazoo River. The topography of the parcel generally slopes to the east. Historically, a Consumers Power steam and electrical generating power plant was located on the East Michigan parcel, although previously existing structures have been demolished. Most recently, the East Michigan parcel was used as an equipment staging area by the Michigan Department of Transportation (MDOT) during the 1995-1996 East Michigan Avenue bridge construction over the Kalamazoo River. Hence, the exposed soils are likely a result of site grading and possible filling conducted by the MDOT following bridge completion. The Hotop and Ampersee parcels consist of large, undeveloped areas covered predominantly with mature deciduous trees and scrub vegetation. Historically, these parcels were utilized as disposal areas for waste ash generated from the operational power plant on the East Michigan parcel.

#### 3.4 Site History

The site history of the subject property was evaluated through the review of available aerial photographs, historic maps, topographic maps, Sanborn Fire Insurance maps and R. L. Polk City of Kalamazoo directories. The following aerial photographs and related references were reviewed for the Phase 1 investigation:

Phase I Environmental Site Assessment East Michigan Avenue/Former Consumers Power Site Kalamazoo, Michigan, January 10, 1997

Source	Scale	<u>Date</u>
F.W. Beers & Co. Atlas of Kalamazoo County	1" = 264'	1873
F.W. Beers & Co. Atlas of Kalamazoo County	1" = 264'	1890
George A. Ogle & Co. Standard Atlas of Kalamazoo County	1" = 2,640'	1910
H.C. Haley Atlas of Kalamazoo County	1" = 400'	1913
U.S.G.S. Topographic Map	1" = 5,280'	1916
U.S.G.S. Topographic Map	1" = 5,280'	1918
U.S.G.S. Topographic Map	1" = 400'	1924
Sanborn Fire Insurance Map	1" = 100'	1932
Soil Conservation Service Aerial Photograph	1" = 1,760'	1938
Sanborn Fire Insurance Map	1. = 100,	1950
Soil Conservation Service Aerial Photograph	1" = 1,760'	1960
Sanborn Fire Insurance Map	1" = 100'	1965
U.S.G.S. 7.5' Topographic Map	1" = 2,000'	1967
City of Kalamazoo, Department of Public Works Aerial Photograph	1" = 100,	1968
Sanborn Fire Insurance Map	1" = 100'	1969
Sanborn Fire Insurance Map	1" = 100;	1972
Soil Survey of Kalamazoo County	1" = 1,320	1974
City of Kalamazoo, Department of Public Works Aerial Photograph	1" = 100,	1978
Kalamazoo County Planning Department Aerial Photograph	Unknown	1983
City of Kalamazoo, Department of Public Works Aerial Photograph	1" = 100'	1986
Kalamazoo County Planning Department Aerial Photograph	Unknown	1992

In addition to the references listed above, Polk directories were reviewed for business and residential addresses in the vicinity of the subject property along East Michigan Avenue (formerly known as East Main Street or East Avenue), Ampersee Avenue (known as Amperse Avenue prior to 1916), Hotop Avenue, River Street (which previously extended north from East Main Street to Gull Street near the river) and Sherwood Avenue. Review of the Polk directories indicated that addresses along East Michigan Avenue changed in 1926.

Miscellaneous records from the City of Kalamazoo Records Management Department were reviewed by KIESER & ASSOCIATES for the East Michigan and Ampersee parcels of the subject property. However, at the time of this review, portions of the historical records for the Hotop and Ampersee parcels were unavailable, as they were being transferred to microfiche (Barnes, personal communication, 1996). The remainder of the Site History section describes the chronological uses of the subject property based on:

- · Residential Occupancy
- · Economy Power Company Plant Construction
- · Consumers Power Company Plant Construction
- · Plant Shutdown and Site Vacancy

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Residential Occupancy - Late 1800's to Early 1900's

Review of the 1873 Atlas of Kalamazoo County indicated that the subject property was undeveloped at that time. The road forming the southern boundary of the subject property was identified on the map as "East Avenue." A set of railroad tracks, identified as "Michigan Central Railroad" (M.C.R.R.), extended across the southern portion of the subject property (at the current location of the Conrail tracks). Ownership of the project site from the atlas was identified as "Kalamazoo Water Power & Manufacturing Company," although no other information was found to verify commercial activities existed at the site as related to this company. Areas to the south, west and east of the subject property appeared to be primarily residential.

The 1890 Atlas of Kalamazoo County identified several plats and what appeared to be numerous residential lot lines on the subject property. The East Michigan parcel was divided into two plats: Harris Addition and Holtenhouse Addition. Three residential structures were located on the East Michigan parcel adjacent to East Avenue. The Hotop and Ampersee parcels were the location of Amperse's Plat. Several roads were located on the map in the Amperse's Plat: River Street, Amperse Avenue, Sherwood Avenue and Hotop Avenue. Two residential structures were located on the east edge of the subject property along the west side of Amperse Avenue.

The 1902 R. L. Polk City of Kalamazoo Directory contained several residential listings for the subject property. These included residential addresses on Amperse Avenue (101, 531, 627), Hotop Avenue (820), East Main Street (605, 613, 711, 819, 827) and River Street (241 and 220). Several new residential listings for the subject property were noted along Amperse Avenue (305), East Main Street (815, 817, 821) and Sherwood Avenue (214, 200) in the 1904 directory. Growth of this residential area continued in 1906 with the following new residential addresses: 815 Hotop Avenue and 811, 823 and 825 East Main Street. In the 1908 directory, new residential addresses on the project site were noted at 807 and 809 East Main Street. Review of the 1910 City Directory revealed a new residence at 601 Amperse Avenue.

Economy Power Company Plant Construction - Early 1900's to Late 1920's

Review of the 1910 Standard Atlas of Kalamazoo County revealed similar plats and lot lines on the subject property as observed in the 1890 Atlas of Kalamazoo County. One additional street, Central Street, was situated on the project site, adjacent to the north side of the M.C.R.R. tracks. Review of a 1957 property appraisal revealed that two, one-story, brick buildings were constructed on the East Michigan parcel of the project site in 1910 (Cole-Layer-Trumble Company, 1957; see Attachment C). The buildings were erected back to back in the southwest corner of the East Michigan parcel, approximately twenty feet from the east bank of the Kalamazoo River and ten feet north of East Michigan Avenue. Each building was approximately 7,000 square feet in size.

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According to the 1912 City Directory, the Au Sable Electric Company occupied a portion of the East Michigan parcel of the subject property at 807-809 East Main Street. It is assumed that the new 807-809 listing for the electric company relates to the two 7,000 ft<sup>2</sup> buildings constructed on the East Michigan parcel in 1910. Several residences immediately east of the power plant (815, 817, 819, 821, 823, 825, and 827 East Main Street) were also listed in the 1912 directory. No residential or commercial listings were noted for Amperse Avenue, Hotop Avenue, River Street or Sherwood Avenue. No changes in occupancy on the subject property were apparent in the 1914 Polk directory.

Review of the 1913 Atlas of Kalamazoo County and the 1916 U.S.G.S. topographic map indicated that a large rectangular structure was situated on the southwest corner of the subject property, along the east bank of the Kalamazoo River. (All other significant features, such as streets and M.C.R.R. tracks, appeared the same in the 1913 atlas as in the 1910 atlas.) A small building was identified on the 1916 topographic map immediately south of the railroad tracks on the west edge of the subject property. Large tracts of wetlands were noted extending north from the railroad tracks and east from the Kalamazoo River, covering what appeared to be the majority of the northern parcels of the subject property. Review of the 1918 U.S.G.S. topographic map revealed no changes from the 1916 topographic map again supporting the presence of low-lying wetland areas occupying substantial portions of these northern two parcels.

The 1916 Polk directory listed Consumers Power Company as the occupant of 807-809 East Main Street. (The deed corresponding to this time period listed Economy Power Company as the owner. It is uncertain as to any possible ownership differences with the two listed entities.) Residences were still noted on the subject property at the following addresses in 1916: 811, 815, 817, 819, 821, 823, 825 and 827 East Main Street and 601 and 627 Ampersee Avenue.

The 1924 U.S.G.S. topographic map did not include building structures. The M.C.R.R. tracks were, however, present across the southern portion of the subject property. A new spur of the tracks extended southwest across the northern half of the East Michigan parcel. Several raised areas, presumably ash fill, were noted on the subject property between the railroad tracks and Sherwood Avenue. These likely corresponded to the disposal of waste ash from power plant operation. Wetlands areas were still noted on the subject property north of Sherwood Avenue, however, many of those previously noted on the Ampersee parcel appeared to have been filled.

Consumers Power Company Plant Operation Period - Late 1920's to Early 1970's

Construction of the Consumers Power steam and electricity generating power plant, historically located on the project site, began in 1926 according to a Kalamazoo Gazette article dated October 3, 1926. (New building structures were added to the existing 7,000 ft<sup>2</sup> structures built in 1910.) The article stated that the plant was fueled by pulverized coal produced on site by electrically driven crushers. The crushed coal was then separated

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magnetically and mechanically prior to combustion. The Consumers Power plant began operation in the spring of 1927, eight months after construction of the plant began (Kalamazoo Gazette, June 3, 1927). The plant had the capacity to supply the City of Kalamazoo with 72,000 horsepower created by passing two hundred tons of coal through the plant per day. Six percent of the burned coal would remain as ash. River water, in the amount of 50.4 million gallons per day, was pumped from the Kalamazoo River as part of the plant's steam generating process.

New construction on the plant in 1926 included two brick buildings and several auxiliary structures (Cole-Layer-Trumble Company, 1957 appraisal, see Attachment C). In addition, the two original building structures were remodeled. The final plant layout, moving clockwise from the southwest corner of the plant, consisted of a 52-foot by 142-foot switchboard room, a 50-foot by 142-foot regulator room, a 58-foot by 130-foot boiler room and a 52-foot by 74-foot generator room. All of the buildings were one-story with the exception of the two-story boiler room. Auxiliary structures on the property included a steel craneway immediately north of the plant (and immediately south of the railroad tracks), a twenty-foot diameter, eighteen-foot high oil storage tank located approximately fifty feet east of the boiler room, a garage located southeast of the plant and a large, one-story storage building located east of the craneway. (Detailed information about the mechanical contents of each room is provided in Attachment C.)

The 1926 Polk directory listed the Consumers Power Company plant at 701-711 East Avenue, indicating a change in street addresses for this area. Residences were noted on the East Michigan parcel of the subject property at 809, 813, 817 and 821 East Avenue. Kalamazoo Flour Mills occupied an address immediately south of the subject property at 812 East Avenue. Numerous residences were listed on the subject property along Ampersee Avenue (409, 413, 415, 417, 510, 601, 615, 627) and a single residence was noted on the property at 821 Hotop Avenue. An entry of interest in the 1926 directory included the Sanitary Dry Cleaning Shop at 906 East Avenue, located on the south side of East Avenue just east of Ampersee Avenue (but not on the subject property).

The 1932 Sanborn Fire Insurance Map identified a large building shown on the southwest corner of the East Michigan parcel as being occupied by "Consumers Power Company Power & Steam Plant." The interior of the plant was similar to the description provided previously. A caption on the map indicated that the plant was heated by steam and powered by electricity. A large, 35,000-gallon "water storage tank" was noted on the project site approximately fifty feet east of the plant. This storage tank, however, was identified as an "oil storage" tank according to the 1957 appraisal. Two railroad spurs branched off from the M.C.R.R. tracks located on the northern edge of the East Michigan parcel. One of the spurs ran west along the north edge of the property, just south of the M.C.R.R. tracks. The second spur ran southwest from the west edge of the property and ended along the north edge of the power plant.

No building structures were observed on the Ampersee and Hotop parcels of the project site according to the 1932 Sanborn map. A residential structure and two garages were indicated on the map east of the subject property at 809 and 823 East Michigan Avenue. Kalamazoo Flour Mills was noted on the map southeast of the

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power plant on the south side of East Michigan Avenue. (No changes to the subject property or the immediately adjacent properties were noted on the 1950 Sanborn map as compared to the 1932 map.)

In review of the 1935 Polk directory, Consumers Power Company was listed as the occupant of 701-711 East Michigan Avenue. One residence (809 East Michigan Avenue) was located immediately to the east of the power plant. Residential listings previously noted for the subject property on Ampersee Avenue and Hotop Avenue no longer appeared in the 1935 directory. However, residential listings were noted for areas surrounding the subject property on the north and east sides. Several commercial businesses occupied parcels in the vicinity of the project site along East Michigan Avenue: Kalamazoo Flour Mills (812), Fred H. Hooi Fruits (816), E.A. Marcy Autos (820) and White Star Refining Company Filling Station (901).

Review of the 1938 aerial photograph revealed no significant changes to the subject property. The power plant was noted on the southern portion of the site; the northern portion of the site appeared to be largely occupied by fill materials and covered with scrub vegetation. Areas to the north and east of the project site appeared to remain primarily residential. Several commercial properties were noted to the west and south of the project site. Due to the small scale of the aerial photograph, the nature of these buildings could not be determined.

Review of the 1945 and 1955 Polk Directories revealed that occupancy of the subject property remained the same as in the 1935 directory; no residences were located on the subject property and the Consumers Power plant occupied the site. According to the 1945 directory, Kalamazoo Flour Mills remained the occupant of 812 East Michigan Avenue and Fred H. Hooi Produce occupied 816 East Michigan Avenue. New industrial and commercial listings noted in the 1955 directory included two businesses on East Michigan Avenue: Frank W. Ashton Feed Company (812) and Kalamazoo Market Basket, Inc. (818-820). In addition, several businesses occupied the addresses of 904-910 Hotop Avenue: Lyon Tools & Die Works, Inc., California Track Harrow Company, Lyon Steel Products Corporation and the Paper Core Plug Company.

In review of the 1960 aerial photograph, the East Michigan parcel of the project site remained occupied by the power plant. The Hotop and Ampersee parcels appeared to be entirely filled by ash disposal, with the exception of a large pit located in the central portion of the two northern parcels. Vegetation covering these parcels appeared denser than previously noted. Increased commercial development was noted to the north, south and west of the project site. This commercial development was noted in areas that appeared to be residential in the 1938 aerial photograph. No other significant changes were observed in areas surrounding the subject property.

Review of the 1965 Sanborn map revealed no changes to the subject property structures. However, a transformer yard was noted to the north of the power plant between the two previously described railroad spurs on the East Michigan parcel. The residential structure located east of the plant and the flour mill located to the southeast were no longer present on the 1965 Sanborn map. City of Kalamazoo records reviewed for the East

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Michigan parcel revealed that Consumers Power Company applied for a sanitary sewer permit on October 27, 1965. No additional information for this permit application, nor other documents referencing sanitary sewage disposal practices, were uncovered during a records review conducted by KIESER & ASSOCIATES.

In review of the 1965 Polk directory, the subject property remained occupied by the Consumers Power Company plant. Town & Country Markets, Inc. was a new listing at 820 East Michigan Avenue. Occupants at the 904-910 Hotop Avenue addresses were the same as noted in the 1955 directory.

The historic power plant still appeared on the 1967 U.S.G.S. topographic map. The land located north of the railroad tracks and south of Hotop Avenue (representing both the Hotop and Ampersee parcels) was shown at an elevation of twenty feet above the Kalamazoo River water level. A ridge with an elevation of thirty feet above the river's surface was also identified on the northwest edge of the Hotop parcel. A large, irregularly-shaped depression containing free-standing water was indicated on the map on the west side of the Ampersee parcel. (This likely corresponded to the open pits now observed within the ash-filled sections of this area of the site.) The 1967 map (which was photorevised in 1973) indicated that the majority of the north and central parcels were covered with vegetation.

Review of the 1968 aerial photograph still revealed the power plant located in the southwest corner of the East Michigan parcel of the subject property. Areas to the south of the building structure extending to East Michigan Avenue consisted of landscaped lawns. What is believed to be a large water intake structure or gate, which apparently supplied the power plant with water from the Kalamazoo River, was noted near the southwest corner of the building. A transformer yard and electrical substation were observed to the northwest of the building, immediately adjacent to the Kalamazoo River. Several automobiles were observed parked to the east of the transformer yard.

A large coal storage area was situated immediately to the north of the building structure according to the 1968 aerial photograph. An open steel craneway and railroad trestles were also located in this area. A heavy concrete pier was noted at the west end of the railroad trestle. A security fence and railroad tracks were observed to the north of the coal storage area. Limited amounts of debris were located along the west end of this fence. A storage shed was observed near the northeast corner of the East Michigan parcel, immediately to the south of the railroad tracks. A steel, above ground storage tank was situated to the southwest of the storage shed.

In review of the 1968 aerial photograph, the Hotop and Ampersee parcels of the subject property remained vacant. A large, irregularly-shaped pit was observed in the southwest corner of this area of the subject property. An oval-shaped pit occupied the majority of the north end of the Ampersee parcel. Several unpaved roadways and foot trails were noted throughout this area of the project site. Numerous, large deciduous trees and scrub vegetation were also noted.

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Areas surrounding the project site appeared to be primarily commercial in 1968. Several commercial buildings were noted along Harrison Street and Gull Street to the west and north of the site. A small building structure was observed immediately to the south of the subject property along the south side of East Michigan Avenue. A bulk oil and gasoline storage facility was situated to the southwest of the site, west of the Kalamazoo River, at the corner of East Michigan Avenue and King Highway.

No changes to the subject property were evident on the 1969 Sanborn map as compared to the 1965 Sanborn map. However, a filling station was shown on the 1969 map on the property previously occupied by Kalamazoo Flour Mills, located to the south of the project site. No substantial changes to the subject property or the adjacent properties were evident on the 1972 Sanborn map.

Consumers Power Company Plant Shut Down and Site Vacancy - Early 1970's to Present

In review of the 1974 aerial photograph, the subject property building structures, as described previously, were all observed on the project site. The power plant did not appear to be in operation as the ash-covered Hotop and Ampersee parcels were covered with small trees, ground cover and few signs of recent traffic or use. The scale of the aerial photograph used in the survey precluded identification of more specific details on the subject property.

Review of 1965-1974 Polk directories indicated that the previous location of the Consumers Power Company plant (701-711 East Michigan Avenue) was listed as "vacant" for the first time in 1974. Lyon Steel Products Corporation remained the occupant of 904-910 Hotop Avenue in 1974. The 1984 and 1995 Polk directories revealed no listings for the subject property. No changes for surrounding properties as compared to the 1974 directory listings were noted in these later directories.

As observed in records on file with the City of Kalamazoo, on September 7, 1976, Mr. W.C. Hopkins of the Electric Motor Service Company, then owner of the subject property, applied for a wrecking permit from the City of Kalamazoo. The permit application stated that the land was to be filled and leveled by the World Wide Wrecking Corporation of Washington D.C. According to a letter written by a lawyer representing the subject property owner, W.C. Hopkins, to the City of Kalamazoo in the Fall of 1976, Mr. Hopkins was in the process of removing salvageable materials from the old Consumers Power Plant located on the project site. City records and an article from the Kalamazoo Gazette, dated November 15, 1976, revealed that demolition of the site was completed on November 15, 1976 by the World Wide Wrecking Company.

In the 1978 aerial photograph, the subject property appeared vacant. No building structures were observed on the property and the East Michigan parcel appeared to have been leveled. Remnants of the transformer yard, most likely the concrete transformer pads, located in the northwest corner of the East Michigan parcel were visible. The concrete retaining wall located in the southwest corner of the East Michigan parcel was present on the east bank of

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the Kalamazoo River. Large and small deciduous trees were noted on the majority of the Hotop and Ampersee parcels. Two large pits located on the Ampersee/Hotop parcels of the subject property (and still observed today), were clearly visible. Several large objects, possibly tents, were visible in the west end of the western-most pit. A two-track road led west from the southeast corner of the Ampersee parcel around the east side of the eastern pit. A power pole stood near the southeast corner of the Ampersee parcel, just south of the two-track roadway.

The subject property remained vacant in the 1983 aerial photograph. Maturation of the trees covering the Hotop and Ampersee parcels was evident compared to the 1978 aerial photograph. A powerline running through the entire length of the northern parcels on the east side of the property was clearly visible. A large, white object, presumably a tent, was visible in the center of the northern parcels. The scale of the photograph and the dense vegetation precluded identification of any changes in topography (i.e., the two pits) on the northern parcels of the site. Light vegetation covered the East Michigan parcel. An unpaved driveway was noted extending from the abandoned portion of Ampersee Avenue across most of the northern portion of the East Michigan parcel. Areas to the south of Sherwood Avenue and immediately east of Ampersee Avenue appeared wooded in the photograph.

Review of the 1986 aerial photograph revealed that the subject property appeared more overgrown with trees and vegetation than in the 1978 photograph. The two pits were still visible in the 1986 photograph, however, growth of vegetation on the project site made distinction of their boundaries less clear. The two-track road visible in the 1978 photograph no longer appeared in 1986. A new powerline led south from the middle of the north edge of the subject property across the entire north to south length of the three parcels. The power line noted in the 1978 aerial photograph was no longer observed in 1986.

Dense vegetation on the three parcels of the subject property appeared in the 1992 aerial photograph. Mature trees covered the Hotop and Ampersee parcels as well as the northeast corner of the East Michigan parcel. Identification of any changes in topography on the site was precluded due to the dense vegetation on the site. Adjacent properties appeared the same as described for the 1983 photograph.

Efforts to confirm the above information on historic activities at the project site were attempted by contacting previous employees of the Consumers Power steam and electricity generating power plant. These attempts were unsuccessful as most of the former employees of the power plant are apparently deceased (Loen and Herdus, personal communications, 1996). Mr. Joe Herdus of Consumers Power Company, Kalamazoo Area Manager, stated that records and old files for the plant had been destroyed or moved over the years since the plant shut down (personal communication, 1996). Mr. Herdus provided the name of a possible contact from the historic plant, Mr. Roger Whiting of Consumers Power Company in Jackson, Michigan. Attempts to contact Mr. Whiting during the course of this investigation were unsuccessful.

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Mr. Orlin Loen, former Director of Utilities for the City of Kalamazoo, stated that he was unable to provide insight into the plant's specific operating procedures (personal communication, 1996). He did recall, however, that the plant generated both steam and electricity for portions of the city, and that waste ash from the plant was stacked to heights of approximately twenty-five feet on the Consumers Power Company property located immediately to the north of the plant (i.e., Hotop and Ampersee parcels).

Other more recently documented conditions at the subject property include the following. A City of Kalamazoo interoffice memorandum dated April 1, 1981 written by a Mr. Robert Bobb to Mr. Orlin Loen stated that open cisterns on the old Consumers Power property at 701 East Michigan Avenue were a safety hazard to the public. These open cisterns may be related to the historic water intake structure or gate observed during the site reconnaissance survey in the southwest corner of the East Michigan parcel.

In May of 1987, the City of Kalamazoo received a letter of complaint from a Mr. Herbert F. Potter of the Dependable Heating Company located at 433 Riverview Drive. The letter stated that raw garbage and other materials dumped on the old Consumers Power Company property at 433 Ampersee Avenue were attracting rats and creating a nuisance in the area. In September of 1987, the City cited the State of Michigan for the trash problem; two weeks later, twenty-five cubic yards of trash were hauled away from the property by Michigan Disposal Service.

#### 3.5 Adjacent Land Use

The project site is bordered to the south by East Michigan Avenue. The Kalamazoo River forms the west border of the project site. Numerous buildings, historically occupied by Kalamazoo Landscaping Service, are located to the west of the subject property, along the west bank of the Kalamazoo River. A vacant building structure is situated north of the project site at the northeast corner of the intersection of Hotop and Ampersee Avenues. Kalamazoo Custom Metal Works, APEC, Ltd. and a Consumers Power transfer station are situated immediately to the east of the subject property. Don Seelye Used Cars and Trucks and Dependable Heating Company were also noted to the east of the project site, adjacent to Riverview Drive.

### 3.6 Wastewater Treatment, Water Supply and Utilities

Based on field observations and information obtained from public agencies, natural gas and electric utilities are available to the project site. The City of Kalamazoo water supply and municipal sanitary sewer service are also available in this area. Inquires made to Mr. Tobias Foust, Environmental Health Division of the Kalamazoo County Human Services Department, revealed no records of water quality, well logs or septic system installations for the subject property (personal communication, 1996). However, pursuant to a review of the 1957 appraisal of the subject property, a four-inch diameter water well, drilled to a depth of 48 feet, was historically located in the switchboard

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room of the power plant (see Attachment C). At the time of this reporting, KIESER & ASSOCIATES was unable to determine whether this well had been removed based on inquires made to local agencies.

#### 3.7 Floodplains and Wetlands

Based on the site reconnaissance and review of a Flood Insurance Rate Map of the Federal Emergency Management Agency for the City of Kalamazoo (FEMA, 1985), limited portions of the subject property are currently identified within a mapped 100- or 500-year floodplain. Areas of the three parcels immediately adjacent to the Kalamazoo River are located in a mapped 100-year floodplain. A portion of the southeast corner of the East Michigan parcel is also identified within a mapped 100- and 500-floodplain. Prior to historical filling and development of the subject property, large portions of the subject property may have been located in floodplain areas, although floodplain maps prior to 1985 were not available to confirm this condition.

Pursuant to a review of the 1967 U.S.G.S. topographic map and 1974 Soil Survey of Kalamazoo County, no recent areas of wetlands were noted on the subject property. A review of historic topographic maps from 1916 and 1918 did, however, reveal extensive wetland areas on the Hotop and Ampersee parcels. The presence of historic wetlands on the East Michigan parcel could not be readily determined.

#### 4.0 SITE RECONNAISSANCE

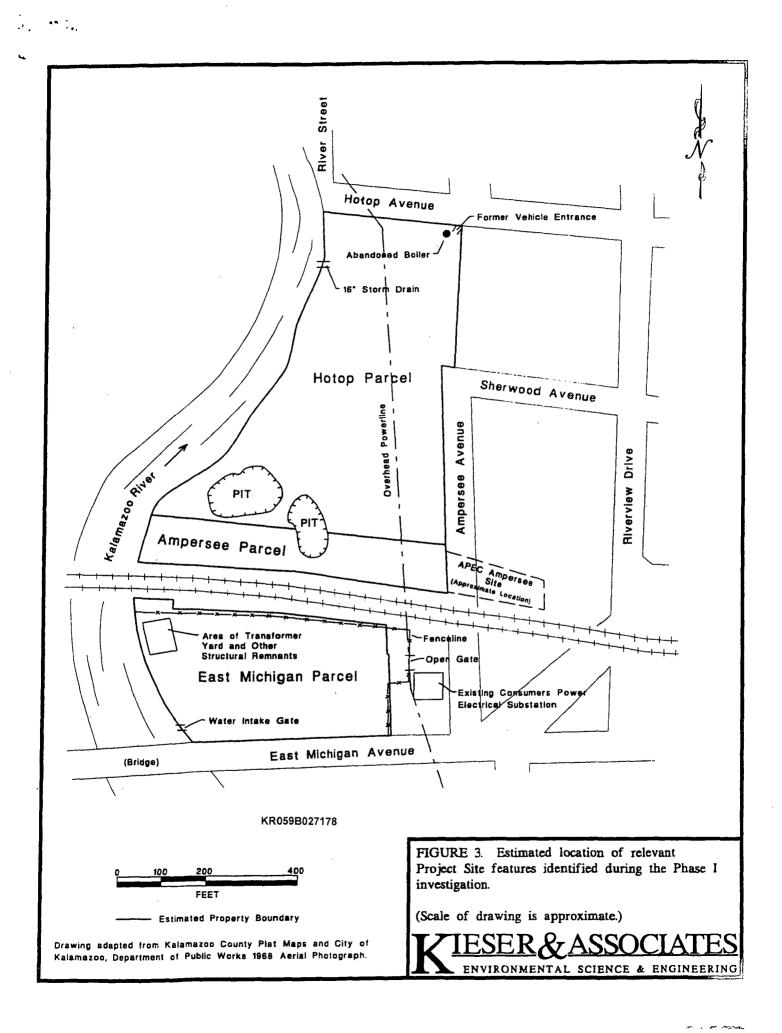
A site reconnaissance survey was conducted on December 12, 1996 from approximately 2:00 p.m. to 4:00 p.m. by representatives of KIESER & ASSOCIATES to identify possible areas of environmental concern at the project site or on adjacent properties. The reconnaissance survey was completed under cloudy/rainy skies with air temperatures of approximately 40°F. Field personnel had access to all areas of the subject property. The following discussion provides a summary of pertinent site observations. Reference to Figure 3 is recommended for the reconnaissance survey description.

#### 4.1 Site Reconnaissance

East Michigan Parcel

This portion of the subject property was comprised of a vacant lot consisting primarily of an open area with exposed soils and a limited wooded area. The topography of the parcel generally sloped to the east. The open area of the parcel, which encompassed the eastern three-fourths of the lot, was most recently used as an equipment staging area by the Michigan Department of Transportation during the 1995-1996 reconstruction of the East Michigan Avenue bridge over the Kalamazoo River. Ground surfaces in this area of the parcel were generally uneven and contained numerous bricks, scrap coal, gravel and broken pieces of concrete.

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A small wooded area was noted along the west property boundary, immediately adjacent to the Kalamazoo River. Remnants of building foundations and former water intake structures related to the historic power plant, were noted in the wooded area. A dilapidated chainlink fence, largely overgrown with vegetation and approximately six feet in height, was situated along the west, north and east boundaries of the parcel. The Conrail railroad tracks were located immediately adjacent to the north boundary of the parcel, beyond the chainlink fence. The southern boundary of the parcel was formed by East Michigan Avenue.

The site reconnaissance survey of this parcel was initiated near the southeast corner of subject property and proceeded in a generally counter-clockwise direction. The chainlink fence along the east property boundary was not uniform; various types of fencing were noted in this area. The southeast corner of the parcel appeared to be lower in elevation than the remainder of the lot. A large area of ponded water was noted covering the majority of this corner of the parcel. This likely resulted from site grading following MDOT's demobilization of equipment from this area. Several mature deciduous trees were observed immediately adjacent to the chainlink fence. Approximately 100 feet north of the southeast corner of the parcel, a 55-gallon drum lid was observed. The lid was labelled "Citco Tractor Hydraulic Fluid." An open gate was noted near the midpoint of the fence along the east property boundary.

Immediately to the northwest of the open gate, a series of pipes and manholes were observed on the property immediately adjacent to the project site. Piping noted in this area included two sets of four six-inch diameter capped pipes approximately six and eight feet in height, two capped pipes approximately five and three feet in height, what appeared to be a well head pump, two vent pipes and two manholes. One manhole cover was marked "Consumers Power Underground System"; the second was unmarked. An unpaved roadway and a Consumers Power transfer station were noted to the east and south of these structures, respectively. The roadway, transfer station and piping are not believed to be a part of the subject property.

A second gate was noted along the fence in the northeast corner of the parcel. Pursuant to a review of historic aerial photographs, it appears railroad tracks may have entered the project site through this gate. This northeast corner of the parcel was also noted to be slightly higher in elevation than the center of the parcel. It appears that soils and vegetative debris may have been pushed into this area during demolition of the historic power plant. Limited amounts of paper debris were noted along the east property boundary immediately adjacent to this fence. Based on currently available descriptions of the site, the actual limits of the property boundary in this area are not clear.

The site reconnaissance survey continued by proceeding along the northern boundary of the parcel. A cement pad, approximately six-foot by four-foot in size was noted approximately one-quarter of the way west of the northeast corner of the parcel. The pad was situated approximately twenty feet south of the chainlink fence forming the north boundary. Scrap coal and several broken electrical insulators were scattered on the ground in the area immediately surrounding the pad. Another double-gate was noted in the fence immediately adjacent to this pad.

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Several large pieces of approximately six-inch diameter metal pipe were noted to the north of the fence. This pipe appeared to be filled with a "cement-like" substance. Historically, this pipe may have been used to transport the slurry waste ash from the power plant to disposal areas located on the Hotop and Ampersee parcels or the subject property.

The ground surfaces along the north parcel boundary were generally uneven and covered with scrub vegetation, scrap coal and miscellaneous construction debris. Thicker scrub vegetation, broken electrical insulators and small deciduous trees were noted adjacent to the chainlink fence in this area. A cement pad, approximately four-feet by four-feet in size, was observed near the center of the northern fence. A wooden frame, constructed of two-by-four lumber and approximately four-feet by two-feet in size, was noted immediately adjacent to the cement pad. Several rusty containers, approximately one-gallon in size, were located around the cement pad. No readily identifiable markings were noted on these containers.

A capped manhole was observed along the northern parcel boundary approximately 100 feet east of the northwest corner of the parcel. The manhole was situated approximately ten feet south of the fence. Two four-inch diameter pipes were noted approximately twenty feet to the east of the manhole. One pipe was approximately 12-inches in height and capped. The cap was labelled "Stockham". The other pipe was uncapped and approximately three inches high.

The northwest corner of the parcel and areas immediately adjacent to the Kalamazoo River, along the western portion of the parcel, were wooded and contained foundation and other structural remnants of the historic power plant. Numerous deciduous trees and mounds of soil were observed in this area. Another large cement pad was noted immediately adjacent to the chainlink fence. Direct observation of the surface of the pad was obscured by mounded soils, but pursuant to a review of the 1968 aerial photograph, the pad appeared to be approximately 90-feet by 100-feet in size. Historically, this portion of the parcel contained a transformer yard. A chainlink fence which extended the along the length of the western parcel boundary was noted immediately to the west of the cement pad. The ground surfaces to the west of the fence sloped sharply downward towards the Kalamazoo River.

Numerous concrete structures were observed on the cement pad located in the northwest corner of the parcel. The concrete structures were approximately 25 feet in length, two feet in width and two feet high. The east-west structures were situated approximately four feet apart in two rows orientated north to south; each row contained six structures. A centrally located metal rail was noted along the top of several of the structures. Reinforcing metal rods are also observed in the southern-most structures. Pursuant to a review of the 1968 aerial photograph, it appears that several transformers were attached to these reinforced concrete structures. Several broken electrical insulators were noted in this area, although no remaining signs of the transformers were observed. A crushed and rusted 55-

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gallon drum was noted between two of the southern concrete structures. Although direct observations of all areas of the cement pad was not possible due to mounded soils, no readily identifiable signs of soil staining were noted in this area.

A series of six, capped pipes were noted immediately adjacent to the west edge of the remnant concrete structures. The approximately four-inch diameter pipes were arranged in a row of two series of one foot, 18-inch and two-foot high pipes. No identifying markings were noted on any of these pipes. What appeared to be a large water main and two spigots were noted immediately to the south of the remnant cement structures. A pile of scrap metal was observed immediately adjacent to the water main. A concrete pier was situated to the southeast of the water main. The pier was approximately ten feet in height and six-feet square. Pursuant to a review of the 1957 appraisal of the subject property, this structure was located at the west end of the railroad trestle which was situated immediately to the north of the building structure (see Attachment C).

What was believed to be a large water intake gate was observed near the southwest corner of the parcel, adjacent to the Kalamazoo River. The east end of the intake gate was surrounded by a chainlink fence which extended south to East Michigan Avenue. A portion of the cement foundation of the historic power plant was located immediately to the east of the intake gate, approximately 75 feet north of East Michigan Avenue. The foundation, approximately 75 feet in length and three feet in width, was situated east to west. Limited amounts of construction debris were noted surrounding the foundation.

#### Hotop and Ampersee Parcels

Historically, waste ash from the pulverized coal-fueled Consumers Power steam and electricity plant, previously located on the subject property, was disposed on the Hotop and Ampersee parcels. Observations made during the site reconnaissance survey confirmed that these two northern parcels were covered with ash fill to a depth of approximately twenty to thirty feet above the water level of the Kalamazoo River.

The southern border of the Ampersee parcel was formed by the Conrail tracks which separate the East Michigan parcel from the Ampersee parcel. The Kalamazoo River delineates the western boundary of the Hotop and Ampersee parcels. The northern and eastern boundaries of the two northern parcels were formed by Hotop Avenue and Ampersee Avenue, respectively. Originating from each of the four boundaries, the ground surface sloped steeply upward twenty to thirty feet towards the center of the parcel, forming a plateau of ash across the entirety of the Hotop and Ampersee parcels.

The topography of the ground surface on the ash plateau was generally flat, though uneven due to the possible instability of the ash fill and/or historic grading of the ash fill. A single type of low-lying groundcover plant and a one type of deciduous tree were dominant on the two parcels. The vine-like plant formed a near-solid ground

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cover across the two parcels. The trees covering the property ranged from saplings to approximately three-foot diameter mature trees. Uprooted trees revealed virtually no top soil covering ground surfaces of these two northern parcels. Materials consisted of grey, powdery coal ash. Numerous rabbit burrows were observed during the site reconnaissance across these areas as well.

The site reconnaissance of the Hotop and Ampersee parcels commenced in the southeast corner of the Ampersee parcel and proceeded in a generally clockwise direction. The ground surface on the southern edge of the Ampersee parcel sloped sharply upwards over a distance of approximately twenty feet to a height of approximately fifteen to twenty feet above the surface of the railroad tracks. Immediately to the east of this portion of the parcel, activities on an adjacent property appeared to possibly encroach upon on the subject property. This adjacent property was identified as the APEC/Ampersee Street Site, historically the location of a UST storage and recycling facility operated by APEC, Ltd of Kalamazoo, Michigan. Items on this adjacent lot which could be encroaching on the subject property included abandoned underground and above ground storage tanks, tires, 55-gallon drums and scrap metal. The APEC site was enclosed by a chainlink fence topped with barbed wire.

Walking west along the southern boundary of the parcel, across the top of the ash plateau, a power pole was noted approximately one hundred feet west of the eastern edge of the Ampersee parcel. No transformers were noted on the pole. A six-inch diameter pipe was noted approximately twenty feet west of the power pole. The pipe consisted of several welded sections that followed the contour of the ground surface from the north edge of the railroad tracks to the top of the ash plateau. The pipe went beneath the ground surface at the top of the plateau.

Moving west from the six-inch pipe, an approximate one hundred-foot long by fifty-foot wide by fifteen to twenty-foot deep oblong pit was noted within the plateau (see Figure 3). The east edge of the pit was located approximately 250 feet east of the east property line of the Ampersee parcel; the southern edge of the pit was located approximately seventy-five feet north of the railroad tracks. A six-inch diameter pipe was noted protruding from center of the south wall of this pit, approximately one foot below the ground surface of the upper plateau. This pipe is believed to be connected to the same pipe noted just west of the noted power pole. Historically, this pipe likely served as a means of transport for fluidized waste ash generated from the steam and electricity plant located on the East Michigan parcel of the subject property.

The elevation of the bottom surface of the pit sloped downwards approximately four feet from the south to the north end of the pit. Miscellaneous household debris was scattered across the floor of the depression. Two, rusty 55-gallon drums, one generally intact and one largely crushed, were noted at the southern end of the pit beneath the six-inch pipe. Both drums appeared to have been punctured. No identifying labels or marks were visible on the drums. Twelve- to eighteen-inch diameter trees were growing in the bottom of the pit. In addition, the surface of the pit was vegetated with the leafy groundcover plant.

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A second pit, approximately 100 feet long by sixty feet wide by fifteen feet deep, was noted approximately 200 feet north of the southern edge of the Ampersee parcel, approximately 100 feet east of the west edge of the subject property. The bottom surface of the pit sloped downwards from north to south. A four-inch diameter pipe was noted protruding from the north bank of the pit at an approximate forty-five degree angle to the southeast, approximately ten feet east of the west bank. An approximate ten foot length of the pipe was exposed. A portion of a steel I-beam was also visible approximately ten feet up the bank on the northeast corner of the pit. A 55-gallon drum was noted on the east edge of the pit floor, approximately twenty feet from the pit's north edge. The drum was partially filled with a semi-frozen liquid. No identifiable labels or markings were noted on the drum.

Moving north along the bank of the Kalamazoo River from the southwest comer of the Ampersee parcel, two to three-foot diameter trees were noted hanging over the Kalamazoo River from the west edge of the subject property. The ash embankments of the plateau, which extended to the east bank of the river, were sharply sloped along the edge of the river. Signs of significant erosion of ash materials into the Kalamazoo River were noted along this ash embankment.

Approximately fifteen feet west of the northwest corner of the second pit, a collapsed, metal-frame, electrical tower was noted. Several insulators were left hanging from the metal framework of the tower. Miscellaneous household debris was noted in this area.

Approximately 200 feet south of Hotop Avenue, a sixteen-inch diameter storm drain was noted discharging water at river level on the west edge of the Hotop parcel. A partially buried two-inch diameter steel pipe was noted running north to south along the top edge of the approximate twenty-five foot high ash embankment in this area near the storm drain. The historic function of the pipe could not be ascertained during the course of this Phase I effort.

At the north end of the Hotop parcel, ground surfaces appeared to be wetter and more marshy than the southern regions of the Hotop and Ampersee parcels. However, ash fill was still present in the area. In the northeast corner of the Hotop parcel, a six-foot diameter, ten-foot high, abandoned, metal tank or boiler was noted. A former vehicle entrance to the property from the intersection of Hotop Avenue and River Street was also noted immediately east of the metal tank. A steel cable, affixed with a sign that read "Consumers Power Company - No Trespassing - Private Property," was strung across this former property entrance.

Moving east along the north edge of the Hotop parcel, a chainlink fence with barbed wire was noted on the north edge of the property. Small trees and undergrowth were noted in greater abundance in this area than in other regions of the subject property. This was likely a function of what appeared to be relatively recent clear-cutting under, and adjacent to, an active powerline running southward across the Hotop and Ampersee parcels. This line traversed the property approximately one-hundred-fifty feet west of Ampersee Avenue on the north property line of the Hotop parcel.

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Moving southward along the east edge of the Hotop and Ampersee parcels, a chainlink fence was noted on the east edge of the subject property, beginning approximately five-hundred feet north of the Conrail railroad tracks and extending south to the south property line of the Ampersee parcel.

# 4.2 Chemical Storage and Use

Based upon results of KIESER & ASSOCIATES evaluation of readily available information pertaining to the history and past uses of the subject property, potentially hazardous substances may have been used, stored and subsequently released to the environment during the years of power plant operation at this site.

Coal used to fuel the power plant was stored in piles on the East Michigan parcel adjacent to the north side of the former building. Magnetically-separated residues from the mechanical crushing of the coal for powdered use may have been stored and/or disposed on the northern portions of the subject property. Phase I information generally confirmed that ash residues, generated from the combustion of the coal, were deposited as a water-based slurry on the Ampersee and Hotop parcels north of the railroad tracks. It is estimated that the ash waste located at the subject property covers an approximate eight acre area at a thickness of up to 30 feet. The dewatering action of the deposited ash slurry, its exposure to rainwater infiltration, and seasonally elevated groundwater levels could have resulted in the dissolution and migration to groundwater and surface water of potentially hazardous compounds from the ash waste or the coal piles. Therefore, constituents such as heavy metals in the ash itself, and the potential for historic leaching of these metals, represent environmental concerns which would need to be addressed with additional Phase II investigations.

Water from the Kalamazoo River was reported to have been used for steam generation at this facility. It could not be confirmed, but river water may also have been used to mix the waste ash slurry prior to its deposition on the Ampersee and Hotop parcels. Suspended sediments in water from the Kalamazoo River in the area, historically contained PCBs as a result of discharges from several paper manufacturing facilities located upstream on the Kalamazoo River and its tributary, Portage Creek during the later years of power plant operations. It is possible that contamination contained in river water (suspended sediments) was transported, via the slurry, to the Ampersee and Hotop parcels.

A large transformer yard was located in the western portion of the East Michigan parcel. PCBs are likely to have been present in the oils contained in these transformers. Also, a "transformer house" is depicted on the Sanborn Maps on the east end of the building. Periodic replacement and/or maintenance of the transformers could have resulted in the spillage, generation and/or on-site disposal of PCB-containing oils.

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A facility diagram from an appraisal conducted in 1957 (see Attachment C) indicates the presence of a "machine shop" in the former building. Repair and maintenance of structures, equipment and machinery associated with the facility could have necessitated the use, storage and possible on-site disposal of various oils, paints, solvents, cleaners and degreasing compounds. This issue is especially relevant considering the October 1965 application for a sanitary sewer connection and the uncertainty of on-site disposal practices (for sanitary or other wastes) prior to 1965.

Historic Sanborn Fire Insurance maps also indicated the presence of a 35,000 gallon above ground "water tank" on the eastern portion of the East Michigan parcel. However, the appraisal conducted in 1957 identifies the same tank as a 20-foot diameter by 18-foot high steel oil storage tank. Also from this appraisal, it was noted that oil cooling equipment was present in the former generator room of this facility for the steam turbines. It may therefore be possible that the storage tank contained oil used to cool the steam turbine. Although it could not be specifically determined what type of oil was used for such plant operations, it is possible that leaks or spillage from the tanks or piping may have occurred. If oils were specifically used for cooling purposes, it is likely that these may have contained PCBs. Hence, any leaks or spills could have resulted in PCB discharges to soils at the site.

#### 4.3 Underground Storage Tanks

Based on a review of available information including observations made during the site reconnaissance survey, aerial photographs, and conversations with Mr. Marty Meyers, City of Kalamazoo Fire Marshal, there are no known underground storage tanks currently registered at the site nor have there been any underground storage tanks registered on the property during the period of historical record (Meyers, personal communication, 1996; see Attachment D). Based on a conversation with Ms. Lois Boulette, Hazardous Materials Inspector with the Michigan Department of Environmental Quality, Underground Storage Tank Division (USTD), Plainwell District Office, the subject property is not reported to be the location of any registered, abandoned or leaking underground storage tank systems (personal communication, 1996).

#### 4.4 Regulatory Review

Known or suspected on-site or off-site sources of environmental contamination for the subject property were identified through inquiries to local and state regulatory agencies. The subject property is not included on the list of current Superfund sites identified by the CERCLA program as administered by the United States Environmental Protection Agency (U.S. EPA). The Kalamazoo River and Portage Creek, however, do appear on the National Priorities List related primarily to historic paper mill discharges containing PCBs. The subject property also does not appear on the current Michigan Act 307 List of contaminated sites (Michigan's equivalent of the federal Superfund list) including sites identified by the former Michigan Environmental Response Act 307 of 1982, as amended (MERA). It also does not appear under listings for the former Leaking Underground Storage Tank Act

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478. Both MERA and LUST Acts have been replaced by Part 201 and Part 213 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, and are administered by the Michigan Department of Environmental Quality (MDEQ).

A computerized query of federal and state databases was also conducted through Environmental Risk Information and Imaging Services (ERIIS) of Alexandria, Virginia for areas surrounding the subject property. The computerized search included the following databases:

National Priorities List (NPL) - The Superfund List of uncontrolled or abandoned hazardous waste sites targeted under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) administered by the United States Environmental Protection Agency (USEPA).

Resource Conservation and Recovery Information System - Treatment, Storage and Disposal Facilities (RCRIS\_TS) - Information pertaining to those facilities that either treat, store or dispose of USEPA regulated hazardous waste.

Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) - A database of suspected or uncontrolled hazardous waste sites being reviewed for inclusion on the NPL List.

No Further Remedial Action Planned Sites (NFRAP) - A list of sites which have been removed from the CERCLIS Database.

Resource Conservation and Recovery Information System - Large Quantity Generators (RCRIS\_LG) - Information pertaining to facilities that either generate more than 1000 kg of EPA regulated hazardous waste per month or meet other applicable requirements of the Resource Conservation and Recovery Act (RCRA).

Resource Conservation and Recovery Information System - Small Quantity Generators (RCRIS\_SG) - Information pertaining to facilities that either generate between 100 kg and 1000 kg of EPA regulated hazardous waste per month or meet other applicable requirements of RCRA.

Civil Enforcement Docket (DOCKET) - USEPA's system for tracking US Department of Justice civil judicial cases since 1972.

Toxic Release Inventory System of 1992 (TRI) - Information on the industrial release and/or transfer of toxic chemicals reportable under Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA).

Federal Reporting Data System (FRDS) - Information pertaining to public water supply wells and treatment facilities.

Emergency Response Notification System - 1995 (ERNS) - A national database of information concerning the sudden and/or accidental release of hazardous substances and/or petroleum into the environment.

Facility Index System (FINDS) - An inventory of all facilities that are regulated or tracked by USEPA.

Open Dumps Report (OPENDUMP) - Dumping facilities not in compliance with Section 4004 of RCRA.

Nuclear Power Facilities (NUCLEAR) - All licensed and active nuclear power plants in the United States.

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Michigan Environmental Contamination List (HWS) - Volumes One and Two of the list of Michigan Sites of Environmental Contamination established under Part 201 of the Natural Resources and Environmental Protection Act (NREPA) administered by the Michigan Department of Environmental Quality (MDEQ).

Michigan Leaking Underground Storage Tank Report (LRST) - Michigan underground storage tank systems reported as leaking.

Michigan Solid Waste Facilities (SWF) - Active and inactive solid waste landfills and processing facilities in Michigan.

Michigan Facility and Tank Data Report (RST) - All active and inactive underground storage tank systems registered in Michigan.

Figure 4 presents all sites identified within a one mile radius of the subject property by the ERIIS database search. (All supporting documentation pertaining to the sites appearing in Figure 4 is presented as Attachment E.) All known or suspected sites of environmental contamination identified by the ERIIS database search in the NPL, CERCLIS, HWS, and LRST databases are summarized in Table 1.

Based on a separate KIESER & ASSOCIATES review of Volumes One and Two of the Proposed List - Michigan Sites of Environmental Contamination, April 1995 for FY 1996, the "Gull Road and Riverview Drive Site" (several parcels at the southeast corner of Gull Road and Riverview Drive), although not identified by the ERIIS search, was also determined to be located within the one-mile radius of the subject property.

Based on a conversation with Ms. Lois Boulette, Hazardous Materials Inspector with the Michigan Department of Environmental Quality, Underground Storage Tank Division (USTD), Plainwell District Office, the subject property is not reported to be the location of any registered, abandoned or leaking underground storage tank systems (personal communication, 1996). Also, a former "filling station" located at 822 East Michigan Avenue as depicted on 1969 and 1972 Sanborn Fire Insurance Maps was not, to Ms. Boulette's knowledge, the location of any registered, abandoned or leaking underground storage tank systems. (This former filling station is now a vacant lot.)

In addition, Ms. Boulette mentioned that a currently operating Total Gasoline Station located at 605 East Michigan Avenue at Harrison Street, two blocks west of the subject property, had recently reported the discovery of a significant amount of free product phase gasoline in subsurface soils and groundwater while conducting UST excavation activities. As this property is on the west side of the Kalamazoo River, it should not impact the subject property. The above information was also confirmed in a conversation with Ms. Deb Clark, Environmental Quality Analyst, Michigan Department of Environmental Quality, Underground Storage Tank Division (USTD), Plainwell District Office (personal communication, 1996).

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Table 1. Sites of Known Contamination Identified within Approximately One Mile of the Subject Property by the ERIIS Database Search.

ERIIS <u>MAP I.D. #</u>	FACILITY & LOCATION	CONTAMINANTS OF CONCERN	<u>DATABASE</u>
2236	APEC Ampersee St. Lots 430, 434 & 502 Ampersee St.	втех	HWS
2777	Indian Trails Motor Coach 1015 E. Michigan Avenue	Petroleum constituents	LRST
196, 2166	Production Painting 1002 O'Neil Street	Toluene, Xylene Trichloroethene	CERCLIS, HWS
2,834	Lyons Machine Builders 904-910 Hotop Avenue	BTEX, PNAs, Metals	HWS
2053, 2273	E.M. Sergeant 542 E. Michigan Avenue	Petroleum constituents BTEX	LRST, HWS
63, 120	Auto Ion Chemicals, Inc. 74 Mills Street	Cyanide, Chromium	NPL, HWS
1146	Bahr Oil Company 535 E. Ransom Street	Petroleum constituents	LRST
190, 2165	Speareflex Corporation 241 E. Kalamazoo Avenue	Trichloroethylene, PCB DCE	CERCLIS, HWS
5270	Williamson Lumber 1123 Kings Highway	Petroleum constituents	LRST
2666	Hightech Collision 501 S. Pitcher Street	Petroleum constituents	LRST
1457	Cars-R-Us 202 E. Michigan Avenue	Petroleum constituents	LRST
2123	Emro Marketing (United #6262) 1123 Riverview Drive	Petroleum constituents	LRST
4770	The Upjohn Co. (10/10/91) 300 Portage Street and South	Petroleum constituents	LRST
2138	Portage and Second Street Area 631 2nd Street	TCE, 1,2 DCA, PCE	HWS

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2226	Sinclair Bulk Storage 1000 4th Street	BTEX	HWS
4554	Statler Ready Mixed Concrete 1000 4th Street	Petroleum constituents	LRST
14	Allied Paper/Portage Creek Kalamazoo River	PCBs, Mercury	NPL
2118	Allied Chemical Corp. 511 E. Paterson Street	Pesticides	HWS
3415	Michigan Disposal Service 100 E. North Street	Petroleum constituents	LRST
2154	Waste Oil Storage 1326 E. Crosstown Parkway	Chloroform, TCE, 1,1,1-TCA, 1,1-DCA	HWS
3181	Lumbermens Cedar Source Whse. 910 Sheldon Court	Petroleum constituents	LRST
3015	King Oil Company 432 Paterson Street	Petroleum constituents	LRST
3334	McLeieer Oil Kalamazoo 1718 E. Michigan Avenue	Petroleum constituents	LRST
2281	Arcadia Creek Corridor Rose and Eleanor Street Area	PNAs, Metals Organic Hand Cleaner	HWS
229	ANR Freight System 1400 4th Street	Petroleum constituents	LRST
2224	Pitcher and Paterson Streets 243 E. Paterson Street	Arsenic, Chromium, DCE, Lead, Toluene	HWS
4521	AT&T 133 W. Lovell Street	Petroleum constituents	LRST
2627, 2155	Waste Oil Storage Hazard Street 937 Hazard St.	Petroleum constituents Methylene chloride, TCA, DCA, TCE	LRST, HWS
2064	East Main Union 76 2003 E. Main Street	Petroleum constituents	LRST
2279	Pitcher and Prouty Street Pitcher and Prouty Street Area	PCE, VC, TCE	HWS

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6399 Kalamazoo Township Offices Petroleum constituents LRST
1720 Riverview Drive

4299 Shell Oil Petroleum constituents LRST
491 W. Michigan Avenue

Mr. Paul Massoth, Environmental Quality Manager with the Michigan Department of Environmental Quality, Environmental Response Division (ERD), Plainwell District Office, was contacted by KIESER & ASSOCIATES for available information regarding the subject property. According to Mr. Massoth, the ERD has had minimal involvement with the subject property other than cooperating with the City of Kalamazoo in its efforts to secure a Site Assessment Grant for the tax-reverted site (personal communication, 1996). On February 9, 1996, MDEQ-ERD staff did, however, collect a sample of coal ash from some unspecified location on the subject property (sample labelled, "East Michigan/River") for TCLP metals analysis. No analyzed compounds were detected above method detection limits in the leachate.

Based on a review of the information gathered from the above regulatory agency inquiries, a request was made to review the MDEQ Plainwell District Office files for the following sites considered to be the most likely to have a potential impact on the subject property:

- · Lyons Machine Builders, Kalamazoo, Michigan
- · Indian Trails Motor Coach, Kalamazoo, Michigan
- · Gull Road and Riverview Drive Site, Kalamazoo, Michigan
- · APEC Ampersee Street Site, Kalamazoo, Michigan

The Indian Trails Motor Coach Site has been granted an unrestricted residential closure from the MDEQ-USTD. The Lyons Machine Builders Site has been thoroughly investigated and data suggest that the relatively limited quantities of remaining soil and/or groundwater contamination pose little if any risk to surrounding properties. The parcels comprising the Gull Road and Riverview Drive Site have also been thoroughly investigated and significant amounts of soil and groundwater contamination appear to remain in that area. However, the direction of groundwater flow from the Gull Road and Riverview Drive Site is to the northwest and away from the subject property.

The APEC Ampersee Street Site is the only identified site of known or suspected contamination in the vicinity which may be impacting the subject property. The site is located directly adjacent to the eastern edge of the subject property immediately north of the railroad tracks. MDEQ-ERD records indicate that the APEC Ampersee Street Site was the location of a UST storage and recycling facility operated by APEC, Ltd. Citizen complaints in 1989 resulted in an inspection of the APEC Site by staff of MDEQ-ERD and MDEQ Law Division. Drums storing

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petroleum fluids and soils contaminated with petroleum compounds were observed and documented. In August of 1990, APEC was asked by the MDEQ to conduct investigative and remedial activities to address contamination at the site. No information is available which documents that any such investigative or remedial activities took place at the APEC Site. Therefore, the nature and extent of environmental contamination at this site is unknown. Due to the close proximity of the APEC Site, and its location hydrogeologically upgradient, environmental contamination from the APEC Site may be impacting the subject property. Further, it appears that APEC's operations may encroach on the subject property. Boundary surveys of the subject property as well as the APEC Ampersee Site would be warranted in order to resolve this issue.

Several reports related to the Allied Paper/Portage Creek/Kalamazoo River NPL Site were reviewed by KIESER & ASSOCIATES at the Kalamazoo Public Library, a Site Repository for information provided by the U.S. EPA. Though this NPL Site includes the portion of the Kalamazoo River which borders the subject property, no data were found in the reviewed reports specific to the subject property. Sediments associated with the Kalamazoo River have been documented to contain PCBs, however, without additional data collection, it is not clear what, if any, potential impact historic on-site use of Kalamazoo River water may have on the property.

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#### 5.0 CONCLUSIONS

Conclusions presented herein are based on an evaluation of readily available information obtained during this Phase I Environmental Site Assessment and observations made during the site reconnaissance in conformance with the scope and limitations of ASTM Designate E 1527-94. It is concluded, that due to the nature of historic activities known or suspected to have taken place at the subject property, the potential exists for hazardous substances to be present in soils and other media in quantities and/or concentrations which may pose an unacceptable risk to the public health, safety or welfare, or the environment, thereby meeting the definition of a "facility" under Part 201 of the NREPA. Additional Phase II investigative activities would be necessary to determine the nature, possible extent and relative risks posed by any existing environmental contamination present within the boundaries of the subject property.

The future use of the subject property will be a critical factor to consider as additional investigative efforts are planned and implemented. A thorough knowledge of the future use of the property will enable the development of an investigative approach which is well-focused and cost-effective, as well as the planning of an appropriate strategy to limit environmental liability to a future owner or operator. If the future use of the property is not specifically known at the time that additional investigative activities are planned, conservative assumptions can be made to provide for the planning and implementation of a comprehensive investigative, remedial and liability protection strategy suitable for any possible future use.

Depending upon such future uses, remedial actions would be necessary only as required to comply with Section 7a of Part 201 of the NREPA. This section stipulates that the future owner or operator of a facility mitigate, as necessary, any unacceptable exposures (via inhalation, ingestion and dermal contact) to hazardous substances at the site. Another risk factor to consider would be the geotechnical stability of the on-site soils and fill material. Once again, detailed knowledge of the future use of the site would determine the most appropriate means to assess the above risks.

KIESER & ASSOCIATES recommends that the City of Kalamazoo proceed with the planning and implementation of a Limited Phase II Subsurface Investigation. Such an investigation might include the collection and analysis of soil, fill, leachate and groundwater samples from on-site locations chosen both randomly and with intentional bias toward areas considered (based on the results of the Phase I Environmental Site Assessment) most likely to be potentially impacted with hazardous substances. These areas would include portions of the site adjacent to the APEC property, the ash fill areas north of the railroad tracks, the former location of the transformer yard, the former area of the oil storage tank and any other selected areas which may have potentially been impacted by historical on-site activities.

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The results of a Phase II would determine if the property is a "facility," as well as the nature of any existing contamination. The Phase II results would also determine if any additional investigative activities are necessary to:

- · Further define the nature and extent of existing on-site contamination,
- · Assess potential exposure risks and Section 7a requirements,
- · Support the completion of a Baseline Environmental Assessment,
- · Support the completion of a Section 7a Compliance Analysis,
- Develop appropriate response activities, remedial actions and/or monitoring requirements,
- Otherwise collect information necessary to manage and communicate environmental risks and liabilities.

KIESER & ASSOCIATES further recommends that a legal boundary survey be conducted for all parcels of the subject property. Such a survey would be required by a future owner/operator as part of any liability limiting strategy. It would also resolve concerns associated with the neighboring (and possibly encroaching) APEC property which is known or suspected to be a site of contamination.

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#### 6.0 REFERENCES

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#### 7.0 INTERVIEWS

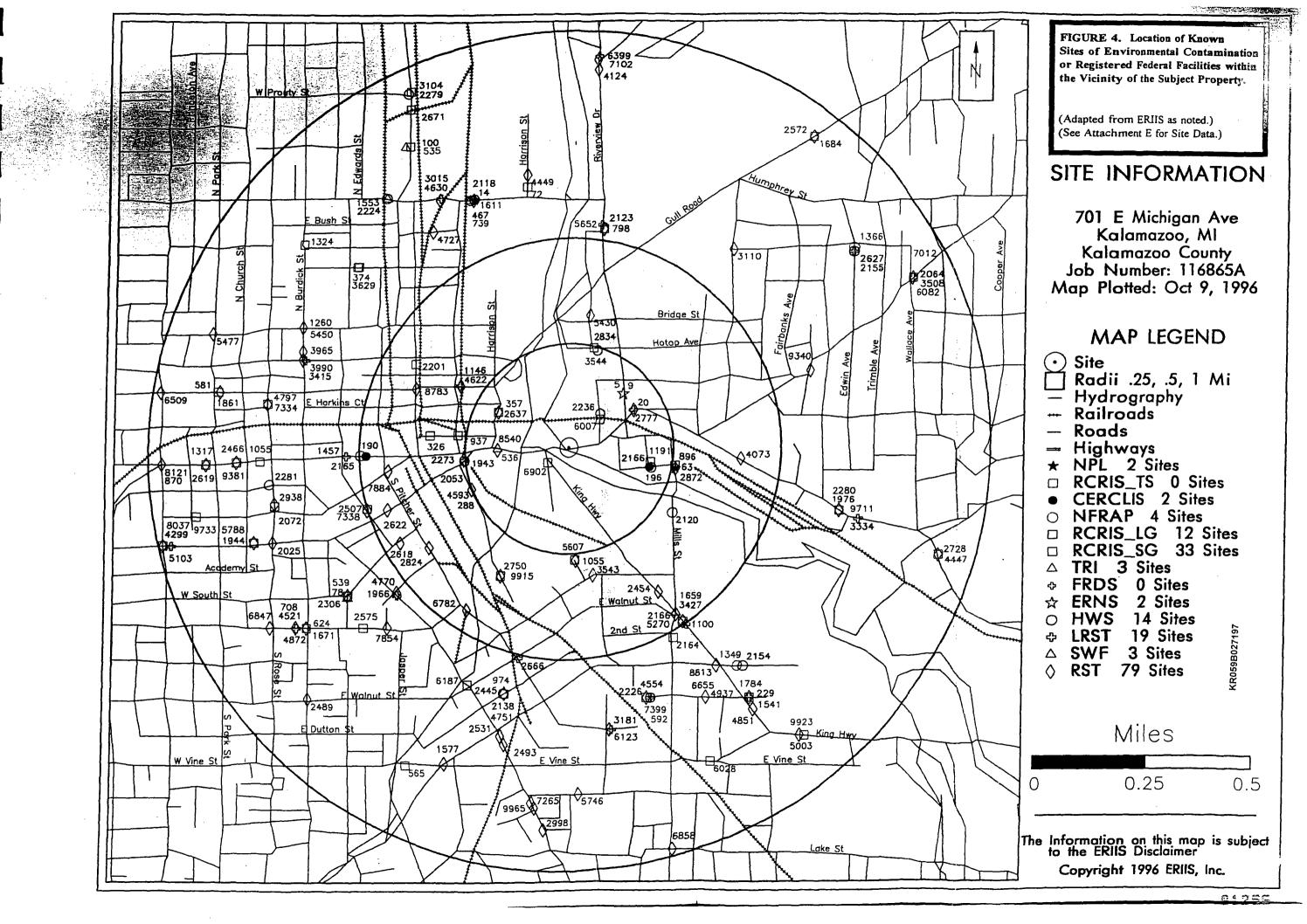
- Ms. Tammy Barnes, City of Kalamazoo, Records Management, personal communication, December 19, 1996.
- Ms. Lois Boulette, Michigan Department of Environmental Quality, Underground Storage Tank Division, Plainwell District Office, personal communication, December 26, 1996.
- Ms. Deb Clark, Michigan Department of Environmental Quality, Underground Storage Tank Division, Plainwell District Office, personal communication, January 7, 1996.
- Mr. Tobias Foust, Groundwater Technician, Kalamazoo County Human Services Department, Environmental Health Division, personal communication, December 13, 1996.
- Mr. Joe Herdus, Consumers Power Company, Kalamazoo Area Manager, personal communication, December 20, 1996
- Mr. Orlin Loen, former Director of Utilities, City of Kalamazoo, personal communication, December 23, 1996.
- Mr. Paul Massoth, Michigan Department of Environmental Quality, Environmental Response Division, Plainwell District Office, personal communication, December 11, 1996.
- Mr. Marty Meyers, City of Kalamazoo Fire Marshal, personal communication, December 10, 1996.

Phase I Environmental Site Assessment East Michigan Avenue/Former Consumers Power Site Kalamazoo, Michigan, January 10, 1997

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Phase I Environmental Site Assessment
East Michigan Avenue/Former Consumers Power Site
Kalamazoo, Michigan, January 10, 1997



# **EXHIBIT STEAM PLANT-2**





April 18, 1997

Mr. Chad Howell
Economic Development & Planning
City of Kalamazoo
214 West South Street
Kalamazoo, MI 49007

RE:

Report on the Phase II Environmental Site Assessment

E. Michigan Ave./Former Consumers Power Site, Kalamazoo, Michigan

Dear Mr. Howell:

In accordance with our revised February 24, 1997 Work Plan authorized on March 3, 1997 by the City of Kalamazoo, KIESER & ASSOCIATES is pleased to present this report on our Phase II investigation for the above referenced facility. The Phase II follows recommendations of the Phase I Environmental Site Assessment prepared for the City in January 1997.

#### PHASE II OBJECTIVES

The objectives of the revised Phase II included:

- Collection of limited and representative soil samples from specific areas of concern at the subject property as identified in the Phase I;
- Submittal of selected soil samples to the laboratory for analysis of selected contaminants of concern as identified in the Phase I:
- Performance of a boundary survey of all parcels within the subject property by a Registered Land Surveyor in order to resolve previously outstanding easement and encroachment issues;
- Review of laboratory results and a determination regarding the subject property's status as a "facility" under Part 201 of 451 PA 1994, as amended;
- Summarize potential environmental liabilities and risks, including potential risk management options to be considered by the current or future owner/operators of the subject property; and,
- Develop conclusions and recommendations based on a thorough evaluation of all information reviewed and collected to date relative to the subject property.

The results of these activities are discussed in the following sections of this letter.

#### SOIL BORING INSTALLATION & SAMPLING ACTIVITIES

On March 4 and 5, 1997, soil samples were collected from previously identified areas of concern at the subject property. These are denoted on Figure 1 and include the Oil Storage Tank Area, Coal Pile, Storage Building, Main Building, Transformer Area, and the Fly Ash Disposal Area. (Figure 1 also shows specific soil boring locations.) Soil borings SB-01 (Oil Storage Tank Area), SB-02 (Storage Building Area), SB-03, SB-04, SB-05 & SB-06 (Main Building Area), and SB-07A (Coal Pile Area, west end) were advanced via a drill rig using hollow-stem augers. Soil borings SB-09 through SB-14 (six total) were manually advanced using properly decontaminated stainless steel soil augers. Surface soil samples SB-08C (Coal Pile Area, east end) and SS-01 and SS-02 (Fly Ash Disposal Area) were collected as surface grab samples.

Although originally identified as an area of concern to be sampled during the Phase II, further examination of the Sluiceway/Outfall Area revealed it to be severely collapsed and inaccessible thus precluding sample collection. The adjacent APEC/Ampersee Site was also identified in the Phase II Work Plan as an area of concern due to the presence of known environmental contamination and the possibility that contamination was encroaching on the subject property. The completed boundary survey indicates that encroachment is occurring, however, the City of Kalamazoo chose to omit this portion of the Phase II sampling activities as a cost-saving measure and to avoid complications to ongoing communications between the City and APEC representatives.

All down-hole equipment advanced by the drill rig was cleaned by power washing prior to use at each boring location. All sampling equipment was properly decontaminated on-site before use with a dilute soap and water solution followed by a final rinse with deionized water. Soil samples were obtained utilizing split-spoon sampling techniques through the center of the augers. Split-spoon sampling obtains an undisturbed soil sample from a selected interval in advance of the cutting head of the auger. At each sampling interval, the split-spoon sampling device was driven 2 feet through undisturbed soil using a power hammer. The penetration rate of the sampler was noted as the number of hammer blows necessary to drive the sampler 0.5 feet.

At each boring location where sufficient sample recovery was available in a zone of interest, soil samples were collected for geologic/physical description, environmental evaluation and description, and/or possible laboratory analysis. Each recovered split-spoon was opened immediately upon recovery and evaluated. Selected soil samples were transferred to laboratory-supplied glass jars using sterile tongue depressors. The jars were immediately transferred to a cooler; samples were kept on ice or refrigerated until their delivery to the analytical laboratory. The collection and transfer of samples to the laboratory were documented using proper chain-of-custody procedures.

Due to the general physical characteristics of the subsurface material at the property (coarse fill comprised primarily of sand, gravel, cobbles, concrete/brick rubble), sample recovery was low or not available at several boring locations. These circumstances often necessitated modification of the target sampling locations and/or depths. Table 1 provides a summary of the soil samples collected during the Phase II investigation for laboratory analysis. Attachment A presents detailed soil boring logs for all sampling locations attempted and depths of sample recovery. (Selected soil samples not submitted for laboratory analysis have been retained by KIESER & ASSOCIATES.) The following discussion summarizes field observations made during the Phase II investigation.

Soil boring SB-01, advanced with the drill rig at the former Oil Storage Tank Area, encountered an approximately 1 foot thick layer of concrete after penetrating surficial sand and gravel fill material. It is suspected that this may have been part of a concrete slab upon which the former oil storage tank rested. Below this concrete layer, the sand and gravel fill material was observed to a depth of 8.5 feet below ground level (bgl). Saturated soil conditions were encountered at approximately 6.5 feet bgl. A soil sample for laboratory analysis was collected from a depth of 4.5 to 5.5 feet. Clay-rich soils were encountered from 8.5 to 10 feet bgl. Soil boring SB-01 was terminated at 10 feet bgl.

Phase II Environmental Site Assessment E. Michigan Ave/Former Consumers Power Site - April 18, 1997

Soil boring SB-02 advanced in the former Storage Building Area, was generally similar in profile to SB-01. Primarily sand and gravel fill material was observed from ground level to a depth of approximately 2 feet bgl. An approximately 0.5 foot thick layer of concrete was observed from 2 to 2.5 feet. This concrete layer may represent the floor of the former storage building. Below this concrete layer, sand, gravel and cinder fill material was observed to be present to a depth of 8 feet. A soil sample was collected from a depth of 4.5 to 5.5 feet for laboratory analysis. From a depth of 8 to 9.5 feet, sand and gravel fill materials were present. Saturation was observed at approximately 8 feet; from 9.5 to 10 feet, a clayey material was noted. This boring was terminated at 10 feet.

Soil borings SB-03, SB-04, SB-05 and SB-06 were installed utilizing the drill rig in the northeast, southwest, northwest, and southeast portions, respectively, of the former Main Building Area. The material profiles of the four soil borings in this area of the site are generally similar. Observations revealed a mixture of man-made building materials (concrete and brick rubble, metal, glass, cinders, and wood) along with a component of natural materials such as sand, gravel, silt and clay. These observations suggest demolition materials are predominant across this section of the site.

Drilling and sample recovery at SB-03, located in the northeast portion of the Main Building Area, was difficult due to the coarse nature of the fill material. A soil sample representing the 5 to 7 feet bgl interval was collected for laboratory analysis. Saturation was encountered at approximately 10 feet bgl. SB-03 was completed to a depth of 16 feet at which historic fill materials were still encountered.

Observations at SB-04, located in the southwest portion of the Main Building Area, similarly indicated the presence of coarse fill material. A high-strength concrete was encountered at 8 feet bgl. The boring was terminated at 9.5 feet due to auger refusal. No representative sample could be recovered from this boring above the concrete due to the coarse nature of the fill.

Consistent with the other borings in this area of the site, drilling and sample recovery was problematic at SB-05 (northwest portion of the Main Building Area) due to the presence of very coarse concrete and brick rubble. However, a representative sample at the 5 to 7 foot interval was obtained and prepared for laboratory submittal. Saturation was encountered at approximately 8 feet bgl. SB-05 was completed to a depth of 11 feet.

Soil boring SB-06, located in the southeast portion of the Main Building Area, indicated the presence of coarse fill materials to the depth explored. A low-strength, "crumbly" zone of concrete was encountered from 6 to 9 feet bgl. A representative sample for the 9 to 11 foot interval was collected and prepared for submittal to the laboratory. The boring was terminated at 11 feet. Saturated conditions were not observed in the recovered split-spoon samples at this location; soils were characterized as moist to very moist.

Similar to the Main Building Area, soil borings SB-07 and SB-08 encountered abundant coarse fill material comprised primarily of concrete and brick rubble. For this reason, representative soil sample collection at these two locations was again problematic. Two attempts were made to sample at both the proposed SB-07 and SB-08 drilling locations, however, split-spoon sampling at depth proved impracticable due to the nature of the subsurface materials.

SB-07A was completed with difficulty in the western portion of the Coal Pile Area. Notably, a zone of coal fragments was encountered between 5 and 7 feet bgl, just below a two foot thick zone of concrete rubble. Due to no sample recovery from the split-spoon sampling device at a depth of 7 feet bgl, a grab sample was collected from the material adhering to the auger flights after the augers were raised from the ground directly followed the split-spoon sampling attempt. This sample was deemed to approximately represent the 6.5 to 7 foot interval.

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Auger refusal was encountered at the proposed SB-08 drilling location (eastern portion of the Coal Pile Area) where two attempts were made to sample the material at depth, the sampling at this location was modified to a surface grab sample collected at the location indicated by SB-08C on the enclosed Figure 1.

SB-09 was placed adjacent to one of the concrete transformer supports located immediately west of the former main building. The subsurface material was comprised of cobbles, gravel, sand, silt and clay to a depth of 2.5 feet bgl. A concrete surface was encountered at 5.5 feet bgl whereupon the soil boring was terminated. A sample of the fine interstitial material amongst cobble and gravel from the 0 to 2 feet bgl interval was collected and prepared for laboratory analysis.

SB-10 was placed downslope from SB-09 and very near the east bank of the Kalamazoo River. The subsurface materials encountered indicated a native profile of topsoil underlain by a primarily sandy material. A sample was collected from the 0 to 1 foot interval and prepared for subsequent laboratory analysis. Saturation was encountered and SB-10 boring was terminated at a depth of 4 feet.

SB-11 and SB-12 were placed immediately to the west of the central portion of the northernmost concrete transformer supports. (See Figure 1). Subsurface materials indicated a probable natural profile of primarily sandy-material at both locations. A soil sample was collected at each of the two locations from the 0 to 1 foot interval. Saturation was not encountered in either boring and each was terminated at a depth of 3 feet.

The soil boring installed at the SB-13 location was completed to a depth of 1 feet bgl. This boring was placed to the north of the concrete transformer supports. The material observed was primarily a black sand with some organic material. SB-14 was located east of the concrete transformer supports in the northern portion of the Transformer Area. The subsurface material collected for laboratory analysis at 0-1 foot bgl was an organic sandy topsoil.

Surface Soil Samples SS-01 and SS-02 were collected from the Fly Ash Disposal Area located north of the railroad right-of-way. Representative samples were collected from just beneath the existing vegetative mat and thin top soil layer at the locations indicated on Figure 1. Sampled materials consisted of fine, powdery blackened ash.

#### **BOUNDARY SURVEY**

A boundary survey map of the subject property is presented herein as Plate 1. The survey was conducted by Jensen Land Surveying of Richland, Michigan. This survey information is used in all site illustrations included with this report.

The completion of the survey has resolved the encroachment concern involving a neighboring underground storage tank recycling business operated by APEC. As depicted on the attached surveyor's drawing, the northern portion of the western fence encroaches on the eastern boundary of the subject property by approximately 3.5 feet. KIESER & ASSOCIATES has noted throughout the course of the Phase I and Phase II investigations at the site, miscellaneous barrels and dismantled underground storage tanks against the fence line encroaching on the subject property.

#### ANALYTICAL RESULTS

This section of the Phase II Report provides a summary of laboratory results for samples submitted for the analyses shown previously in Table 1. A copy of the original laboratory report provided by KAR Labs is included in Attachment B. It should be noted that soil sampling results are primarily evaluated in terms of direct contact criteria to assess site-specific human health risks. Other criteria such as 20X groundwater standards or soil leaching to

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groundwater values are not considered in this evaluation as these apply to closure of a facility and not necessarily to assessing applicable human health risks at this site.

#### Total Metals

Table 2 presents the results for soil samples with detectable concentrations of arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver or zinc (total metals). Soil samples not appearing in Table 2 were non-detect for all total metals analyzed.

Deleted heavy metals concentrations were compared to corresponding Generic Residential Direct Contact Criteria for soils (Michigan Department of Environmental Quality - Environmental Response Division [MDEQ-ERD] June 5, 1995 Operational Memorandum No. 8, Revision 4), default state-wide background levels (MDEQ-ERD September 30, 1993 Operational Memorandum No. 15) and regionally proximate background levels (developed during a background study performed as part of the City of Kalamazoo's Arcadia Creek Redevelopment Project). Results which exceeded the greater of default state-wide or regionally proximate background levels are highlighted on Table 2. Levels of total metals detected in soils which do not exceed the default state-wide and/or regionally proximate background levels for total metals are considered protective of human health.

With the exception of arsenic, heavy metals concentrations detected in the soil samples do not exceed corresponding background levels. Arsenic was detected at concentrations in excess of the corresponding regionally proximate background level (17 mg/kg) in soil samples SB-06 (17.7 mg/kg), SB-08C (37.2 mg/kg) and SS-02 (19.7 mg/kg).

#### PNAs and PCBs

Table 3 presents the results for soil analyses with detectable concentrations of polynuclear aromatic compounds (PNAs) or polychlorinated biphenyls (PCBs). Soil samples not appearing in Table 3 were non-detect for all PNA or PCB compounds analyzed.

The results of PNA and PCB analyses presented in Table 3 were compared to corresponding Generic Residential Direct Contact Criteria for soils. Results which exceeded these criteria are highlighted in the table. Levels of PNAs and PCBs detected in soils which do not exceed generic residential direct contact values are considered protective of human health but may require future land use restrictions in certain circumstances.

Four soil samples (SB-01, SB-05, SB-06 and SB-07A) exhibited concentrations of benzo(a)pyrene in excess of the corresponding Generic Residential Direct Contact Criterion. Benzo(a)anthracene in excess of the Direct Contact Criterion was also detected in the sample from SB-07A.

The only PCB isomer detected in any soil sample was Arochlor 1254, which was present at a concentration of 35,000 ug/kg in soil sample SB-06 (Main Building SE). Although PCBs found at any concentration in soils are not expected to leach (and therefore do not pose a threat to groundwater or surface water), the Generic Residential Direct Contact Criterion for the Arochlor 1254 isomer is 2,300 ug/kg.

### Other Contaminants

Of the soil samples submitted for laboratory analysis for volatile organic compounds (including Scan 1 and Scan 2 analyses), no detectable concentrations above reported detection limits were identified.

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#### **DESIGNATION AS A "FACILITY"**

Due to the presence of environmental contaminants in soils at concentrations in excess of Generic Residential Cleanup Criteria, the subject property is a "facility" as defined in Part 201 of Act No. 451 of the Public Acts of 1994, as amended (Part 201).

#### ENVIRONMENTAL RISK AND LIABILITY ISSUES TO BE CONSIDERED

The City of Kalamazoo

Under Section 20107a of Part 201, most owners and/or operators of a property with existing environmental impact (i.e., a facility) have an affirmative obligation to prevent exacerbation of, and unacceptable human exposures to, existing on-site contaminants ("due care"). An owner/operator of a facility shall also, under Section 20114(1)(g), diligently pursue response activities (and cleanup if necessary) for any contamination for which they are liable.

The City of Kalamazoo, the current owner of the subject facility, is exempted from any "due care" obligations as provided to local units of government in Section 20107a (4) of Part 201. Further, as the owner, the City is exempted from any requirement to pursue response or cleanup activities at the subject facility due to the fact that the City did not cause and is not responsible for the existing contamination.

Of potential concern to the City of Kalamazoo may be various personal injury and nuisance liabilities associated with allowing unrestricted access to the subject facility in its present undeveloped condition. Additional risk assessment activities, with consideration given to specific future land use plans, may be required for the City to fully evaluate and/or mitigate any site-specific risks and liabilities for which they may be liable under other laws.

#### Successive Owner/Operator

A successive owner/operator of the subject property would have an obligation to comply with "due care" requirements under Section 20107a. A new owner's specific due care requirements would be entirely dependent upon their plans for the future use of the site and may require additional investigative activities.

A successive owner/operator of the subject property would be exempted from liability for any existing contamination only if they comply with Section 20126(1)(c) which would require that they perform and submit an adequate Baseline Environmental Assessment (BEA) to the Michigan Department of Environmental Quality. The completion of an adequate BEA on behalf of a new owner/operator is, again, entirely dependent the proposed future use of the property.

In addition, a successive owner/operator may wish to secure for their files a copy of the January 10, 1997 Phase I Environmental Site Assessment for the subject facility prepared by KIESER & ASSOCIATES for the City of Kalamazoo. The information contained in the Phase I Report may provide a future owner/operator with an "innocent purchaser" defense under CERCLA against claims arising from potential future discoveries of additional environmental impact at the site.

Phase II Environmental Site Assessment E. Michigan Ave./Former Consumers Power Site - April 18, 1997

#### RECOMMENDATIONS

- Depending on the future uses of the southern-most parcel of the subject property, a BEA should be completed.
- Based on observations made during the on-site drilling activities, it appears that a substantial portion of the
  southern parcel of the subject facility (south of the railroad tracks) has been filled with coarse demolition
  materials, likely from the razing of the former industrial plant and associated structures located on-site, as well
  as historic fill likely pre-dating the former Consumer Power buildings. This southern portion of the subject
  facility may require further investigation in order to assess its geotechnical stability for future construction.
- We recommend additional analytical characterization of the northern Fly Ash Disposal Area to further evaluate heavy metal, and potentially, the presence of PCBs.
- As part of determining potential re-use options for the Fly Ash Disposal Area, a geotechnical evaluation of ground surfaces and slopes along the river will likely be necessary.
- The need for restrictions to casual access to the northern parcel should be reviewed by legal counsel.
- Assessment of possible subject property contamination related to encroachment by the APEC/Ampersee parcel should be considered in future site investigation efforts.

We have appreciated the opportunity to provide this information and are available to meet with you to discuss results and recommendations. Please do note hesitate to contact our office in these regards.

Sincerely

KIESER & ASSOCIATES

Mark S. Kieser Senior Scientist

Attachments

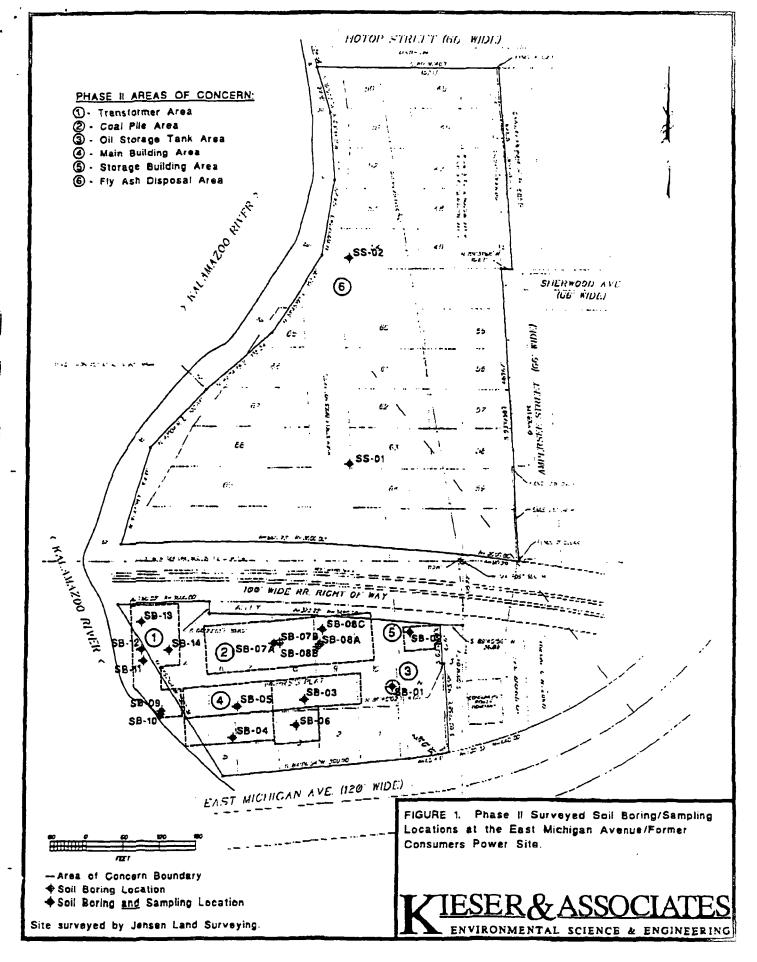


Table 1.
Summary of Locations, Sample Depths and Analytical Parameters for Soil Samples Submitted for Laboratory Analysis; E. Michigan Avenue/Former Consumers Power Site Phase II Investigation.

	Number of Soil				]	Parameter:	5	
Area of Concern	Samples Collected for Lab Analysis	Soil Boring Number	Sampling Depths (bgl)	Metals*	PCB <sub>5</sub>	PNAs	Scan 1	Scan 2 (BTEX)
Oil Storage Tank	1	SB-01	4.5-5.5'		Х	Х	Ī	X
Coal Pile	2	SB-07(A)	6.5-7.0'	Х		Х		
		SB-08(C)	At Surface	Х		X		
Storage Building	1	SB-02	4.5-5.5'			X	X	Х
Main Building	3	SB-03	5-7'	Х	Х	Х	Х	X
		SB-05	5-7'	Х	Х	X	X	Х
		SB-06	9-11'	Х	Х	Х	X	Х
Transformers	6	SB-09	0-2'		X			
		SB-10	0-1'		Х			
		SB-11	0-1'		X			
		SB-12	0-1'		Х			
		SB-13	0-1'		Х			
		SB-14	0-1'		Х			
Fly Ash Disposal Area	2	SS-01	0.25-0.5'	Х	Х	X		
*	·	SS-02	0.25-0.5'	Х	Х	Х		
Number of Lab Samples	15			7	12	9	4	5

<sup>\*</sup> Includes Michigan 10 Metals + Nickel.

#### TABLE 2.

# Laboratory Results for Soil Samples with Detectable Levels of Total Metals at the E. Michigan Avenue/Former Consumers Power Site Phase II Investigation.

(Note: Highlighted concentrations exceed regionally proximate background levels or other corresponding highlighted SWP criteria.)

Soil Boring		Sample	Sample	Arsenic	Barium	Cadmium	Chromism	Соррег	Lead	Mercury	Nickel	Selenium	Silver	Zinc
Number	Date	Location	Depth (bgl)	(ang/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
SB-03	3/04/97	Main Bldg. NE	5.0-7.0*	6.5	45	0.14	,	22	42	0.3	7	<0.5	40.5	52
SB-05	3/04/97	Main Bldg. NW	5.0-7.0°	8.8	178	0.42	13	30	95	1.4	12	<b>40.5</b>	<b>⊲</b> 0.5	
SB-06	3/04/97	Main Bldg. SE	9.0-11.0	317	270	0.74	26	19	150		23	<0.5	<0.5	170
SB-07(A)	3/04/97	Coal Pile West	6.5-7.0°	- 62	40	ده		42	38	ده	12	<b>40.5</b>	40.5	79
SB-OS(C)	3/05/97	Coal File East	At Surface	1377	71	0.17	5	34	80	0.2	5	◁	<0.5	31
2S-01	3/05/97	Fly Ash Area South	0.25-0.5	14.4	164	0.15	12	53	18	0.2	15	∢	⊲3.5	30
SS-02	3/05/97	Fly Ash Area North	0.25-0.5	197	204	0.19	18	52	20	0.2	14	<1	<0.5	40
Gene	ric Residential Dir	rect Contact Value for So	il*	-6.6	30,000	210	2,000	16,000	400	130	32,000	2,100	2,000	140,000
Re	gionally Prezima	te Background Levels**		17	142	•	•	-	85.8	0.16	-	0.95	-	86.6
Default State-Wide Background Levels				5.8	75	1.2	18	32	21	0.13	20	0.41-	1	47
Residential Soil/Water Partition Drinking Water Value***				1 - 2 F 1	1,300	6	>100%	160,000	ID	Paga Ra	100	4.1	4.6	2,400
GSI Soil/Water Partition Value***				53	410	0,77	>100%	2,900	1D	1.10E-03	59	0.41	0.013	-07
GCC Soil/Water Partition Value***				2,200	>100%	130,000	>100%	>100%	ID	47	>100%	90,000	230,000	>100%
Soil Target Method Detection Limit (mg/kg)				0.1	1	0.05	8.2	1	1	0.1	0.1	0.5	0.5	1

<sup>\*</sup> As established by the MDEQ-ERD in Operational Memorandum No. 8, Rev. 4.

#### TABLE 3.

Laboratory Results for Soil Samples with Detectable Levels of PNA and PCB Compounds at the E. Michigan Avenue/Former Consumers Power Site Phase II Investigation.

(Note: Highlighted concentrations exceed corresponding highlighted criteria.)

		.=.			_								· · ·							
							Benzo (a)	Benzo (a)	Benzo (b)	Benzo (g,k,i)	Benzo (k)		Dibenzo (a,h)			Indene				PCB
Soil		Sample	Sample	Acenaphthene	Acesaphthylene	Anthracene	anthracene	ругеле	Quoranthene	perylene	fluoranthene	Chrysene	anthracene	Fluoranthene	Flourene	(1,2,3-cd) pyrenc	Naphthalene	Phenanthrene	Pyrene	Arochlor 1254
Boring Number	Date	Location	Depth (bgl)	(µg/kg)	(ug/kg)	(u g/kg)	(µg/kg)	(ug/kg)	(ag/kg)	(ng/kg)	(ng/kg)	(ug/kg)	(µg/kg)	(ng/kg)	(µg/kg)	(ng/kg)	(ng/kg)	(ng/kg)	(ng/kg)	(µg/kg)
SB-01	3/04/97	Oil Storage Tank	45-5.5	- 78 ( )	<330	2,000	1,700	Sign is	1,800	710	2,000	1,400	<330	3,200	980	500	<330	9,800	3,200	NA.
SB-02	\$76497	Sorage Building	4.5-5.5"	<330	<330	<330	340	<330	<330	<330	<330	440	<330	870	<330	<330	<330	340	790	NA.
SB-03	3/04/97	Main Bldg, NE	5.0-7.0*	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	480	<330	<330	<330	<130	440	· <330
SB-05	3/04/97	Main Bidg. NW	5.0-7.0*	410	<330	810	3,900	4.00	1,800	1,600	2,600	3,700	<330	6,800	<330	980	<330	3,209	9,700	<330
SB-06	3/04/97	Main Bldg. SE	9.0-11.0*	690	<330	3,400	6,800	3020	6,000	3,100	4,100	5,200	<330	17,000	1,100	2,100	<330	19500	. 18,000	=33()(1)
SB-07(A)	3/04/97	Coal Pile West	6.5-7.01	द्राज	<330	13,000	_ Similar	THE STATE OF	14,000	8,200	12,000	9,600	1,100	49,000	8,800	8,400	300	<b>120.20</b>	39,000	NA.
SB-08(C)	3/05/97	Coal Pile East	At Surface	<330	<130	<130	510	430	380	<330	<330	500	<330	920	<330	<330	480	1,600	880	NA.
Generic I	Residential	Direct Contact Value	for Soil*	76,000,000	1,500,000	420,000,000	(1)((1)	3K(2)) =	14,000	1,500,000	140,000	1,400,000	1,400	51,000,000	51,000,000	14,000	15,000,000	1,500,000	32,000,000	-270) -
Residential S	oil/Water F	Partition Drinking Wa	iter Value***	300,000	ID	NL	NL	NL	NL	NL	NL	NL	NL	000,000,6	390,000	NL	17,000	Saltimo S	1,800,000	NL
G	SI Soil/Wa	iter Partition Value**	•	330	ID.	NL	NL	NL.	NL	NL.	NL	NL	NL .	1,300,000	6,200,000	NL	=977)	ID	37,900,000	NL
G	CC Soil/W	ster Partition Value**	••	970,000	ID	NL	NL	NL	NL	NL	NL	NL	NL	710,000	880,000	NL	2,000,000	450,000	450,000	NL
Tar	get Method	d Detection Limit for S	Soil	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330

<sup>\*</sup> As established by the MDEQ-ERD in Operational Memorandum No. 8, Rev. 4.

KIESER & ASSOCIATES

<sup>\*\*</sup> Provided by the City of Kalamazoo. Results of background study performed as part of the Arcadia Creek Redevelopment Project.

<sup>\*\*\*</sup> As established by the MDEQ-ERD in Generic Soil/Water Partitioning Criteria: Technical Support Document, January 17, 1997.

ID = Insufficient data.

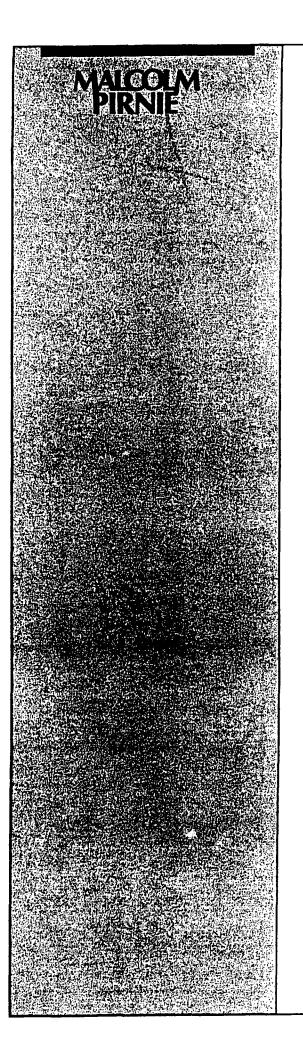
<sup>\*\*\*</sup> As established by the MDEQ-ERD in Generic Soil/Water Partitioning Criteria: Technical Support Document, January 17, 1997.

NA = Not analyzed.

ID = Insufficient data.

NL = "Non-leaching"chemical under most soil conditions.

# **EXHIBIT STEAM PLANT-3**

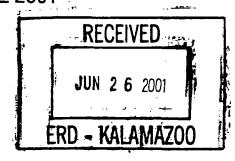


# SITE SUBSURFACE INVESTIGATION REPORT

FOR THE
CONSUMERS POWER SITE
KALAMAZOO, MICHIGAN

PREPARED FOR MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

**JUNE 2001** 



PREPARED BY
MALCOLM PIRNIE, INC.
1500 ABBOTT ROAD, SUITE 210
EAST LANSING, MICHIGAN 48823

MALCOLM PIRNIE

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# CONSUMERS POWER SITE SITE SUBSURFACE INVESTIGATION REPORT

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## 1.0 INTRODUCTION

# 1.1 SITE LOCATION AND DESCRIPTION

The Consumers Power Site is located on the east bank of the Kalamazoo River between Michigan Avenue and Gull Road in Kalamazoo, Michigan. This Site Subsurface Investigation (SSI) report addresses the 7.5-acre northern portion of the site that is bounded on the north by Hotop Street, on the south by the Conrail right-of-way, on the west by the Kalamazoo River, and on the east by Ampersee Street.

The 2.5-acre southern portion of the site is bounded on the north by the Conrail railroad right-of-way, on the south and east by Michigan Avenue, and on the west by the Kalamazoo River. The southern portion of the site is not a subject of this investigation. A site base map is presented on Figure 1.

# 1.2 SITE BACKGROUND

The northern portion of the property was used for coal ash disposal. The northern portion of the site is reported to have been a wetland prior to coal ash disposal activities. The southern portion of the site was originally a Consumers Power generating station that utilized coal to produce power. Potential contamination sources located on or near the site have included transformers, coal, oil, and coal ash (Kieser, 1997).

The surface of the coal ash is approximately 20 to 25 feet above the elevation of the Kalamazoo River. Based on the assumption that the ground surface in the wetland is at or slightly below the elevation of the Kalamazoo River, the ash is estimated to be approximately 25 feet thick. No cover soil is evident over the ash. Vegetative cover and trees up to 12 inches in diameter are established on the surface of the ash.

APEC has historically operated an underground storage tank (UST) recycling facility on the property to the east of the northern portion of the site (Kieser, 1997). Site observations suggest that a number of drums and small USTs are being stored along the fence between the northern portion of the site and the APEC property.

According to the April 18, 1997, report submitted to the City of Kalamazoo by Kieser & Associates, the fence that surrounds the APEC property encroaches onto the northern portion of the site by approximately 2 to 4 feet.



# 1.3 OBJECTIVES

The chemical constituents and physical properties of the soils and coal ash present at the site were characterized to address the following objectives:

- Identify and evaluate the presence and leachability of substances of concern from the coal ash into the underlying groundwater and adjacent Kalamazoo River
- Assess the chemical characteristics of the coal ash and groundwater on the site relative to the relative Part 201 Cleanup Criteria established under the Natural Resources and Environmental Protection Act, Act 451 of 1994, as amended.
- Assess the physical characteristics of the coal ash to evaluate potential future development of the site for multi-family, multi-story residential land use

This investigation was intended to be a limited environmental and geotechnical assessment, to be followed by a more detailed investigation as dictated by the data developed. No additional investigation was conducted as a follow up to the work documented in this SSI report. The limited nature of the work conducted necessarily limits the scope of investigation and analysis.



# 2.0 COAL ASH AND SOIL INVESTIGATION

Between February 18 and February 21, 2000, STS Consultants, LTD (STS) advanced geotechnical/environmental borings through the coal ash and into the underlying soils at the DB-1 (deep boring), MW-1 (monitoring well), MW-2, and MW-3 locations with a CME 550 drilling rig. STS drilled the MW-1, MW-2, and MW-3 borings with solid-stem augers above the water table and hollow-stem augers below the water table to enable subsequent installation of groundwater monitoring wells. At the DB-1 location, drilling below the water table was performed with mud-rotary equipment because a monitoring well was not installed.

Between February 21 and February 22, 2000, four environmental soil borings were advanced through the surficial soils to approximately three feet below the water table at the GSI-1 (groundwater/surface water interface monitoring well), GSI-2, GSI-3, and GSI-4 locations. Drilling was performed with a hand-bucket auger. The soil boring and monitoring well construction logs are presented in Appendix A.

# 2.1 GEOTECHNICAL COAL ASH AND SOIL SAMPLING

During drilling of the geotechnical soil borings, split-barrel soil samples (2-foot long) were collected continuously from ground level to approximately 44 feet below ground level (bgl) at the DB-1 location. Split-barrel samples were collected continuously from ground level to approximately five feet below the water table at the MW-1, MW-2, and MW-3 locations. Geotechnical samples were collected from each interval from which an environmental sample was not collected.

The geotechnical soil samples were submitted to the STS soil laboratory in Grand Rapids, Michigan to be tested for the following:

- Water (Moisture) Content (ASTM D-2216)
- Moisture/density relationship by Modified Proctor (ASTM D1557– Method A)
- Organic content by ignition (ASTM C-311 or D-2974)
- Atterberg Limits (ASTM D-4318)
- Grain size distribution by sieve (ASTM D-421) and hydrometer (ASTM D-422)



The STS geotechnical analytical data package, including sieve analysis results, is presented in Appendix B.

#### 2.1.1 Standard Penetration Test

The Standard Penetration Test (SPT) was developed in 1927 to standardize subsurface sampling practices and to establish a means to estimate the density and strength of subsurface soils for use in foundation design. The basic method was adopted as ASTM D 1586 in 1958, but has been revised periodically. The SPT method consists of the following general procedure:

- 1. Attach a standard split-barrel sampler to the end of the drill rods and lower it to the bottom of the borehole.
- 2. Drive the sampler into the undisturbed soil by repeatedly dropping a 140-lb hammer from a height of thirty inches onto the top of the drill rods.
- Sum the number of hammer blows required to drive the sampler over the interval from 6 to 18 inches and record this value as the uncorrected N value.

The uncorrected N values for intervals within the coal ash ranged from 1 to 10.

Because uncorrected N values recorded in adjacent boreholes are often not reproducible, several authors (Bowles, 1988; Seed and De Alba, 1986; Seed et al., 1983) have developed correction factors to compensate for differing equipment, varying techniques, and overburden stresses. The resulting normalized, standardized value, varyingly reported as the N'55, (N<sub>1</sub>)60, or N'70 value, can be correlated to the relative density and strength of a granular subsurface soil. The subscripts 55, 60, and 70 refer to the driving energy, E<sub>1</sub>, imparted to the soils by the sampling equipment and may vary depending on the source author of the correlation method selected. The standardized, normalized N values may be converted between different E<sub>1</sub> by use of the following relationship:

$$N_1 * E_{r1} = N_2 * E_{r2}$$

Malcolm Pirnie's conversion of uncorrected N values to N'<sub>70</sub> and the subsequent strength and density correlations are presented in Appendix C.

The standardized, normalized N values are useful in determining the apparent suitability of a granular soil as a foundation material. Bowles (1988) correlates N'<sub>70</sub> values to the strength (expressed as an angle of internal friction) and relative density based on the predominant grain



size of the soil. Based on the data collected during this investigation, the coal ash, which is assumed to behave as a fine sand for the purpose of this correlation, has a relative density of less than 0.35 and a strength, or angle of internal friction,  $\Phi$ , of approximately 26 to 28°.

Conventional footers are generally not placed on a soil with a relative density of less than 0.5. Local building codes may specify a minimum relative density requirement. Loose site soils, or in this case the coal ash, would require compaction to a greater density before the placement of conventional footers would be a viable construction alternative.

The relatively low angle of internal friction (<28°) suggests two guidelines: the allowable unloaded sideslopes in the ash will be relatively gentle and the bearing capacity of the ash will be relatively low. Unloaded sideslopes within the ash would likely be required to be no greater than 3:1. Structures would need to be set back from the edges of the ash pile or the ash would need to be reinforced, depending on the design and budgetary considerations of the development project. Before constructing on or near sideslopes in the ash, a detailed slope stability analysis, incorporating the ash density and strength properties as well as the proposed design parameters, should be conducted.

Although a detailed analysis of bearing capacity is beyond the scope of this project, the data acquired during this investigation can be used in a number of simple, conservative bearing capacity approximations. The following discussion of bearing capacity is presented only to provide a general, qualitative perspective of the data. This is not intended to be a detailed geotechnical analysis on which to base design decisions, nor should it be used as such.

Bowles (1988) presents a correlation between SPT values and the allowable net bearing capacity of a soil (for approximately one inch of settlement). The net bearing capacity is the load imparted by the footer, without considering the overburden pressure of the soil. This correlation uses equations developed by Meyerhof (1956, 1974), but Bowles has increased the approximated allowable bearing capacity by 50 percent, based on empirical data that has accumulated since Meyerhof originally developed the equations. Based on this correlation and the estimated (N')70 values from the site SPT data, the allowable net bearing capacity of the coal ash is less than 2,000 lbs/ft² (100 kPa). The correlation is presented in Appendix D.

Numerous authors have developed equations for estimating the ultimate bearing capacity of soils based on the strength and density of the soil and the size, depth, and shape of the footers. The ultimate bearing capacity includes both the load imparted by the footer and the overburden pressure of the soil. A detailed assessment of bearing capacity is beyond the scope of this report, but the Terzaghi equation provides one of the simpler means to estimate the ultimate bearing



capacity of the soil. Using the strength and density values of the coal ash, assuming that the foundation design consists of square footers at a depth of four feet, and that the design engineers require a safety factor of 3, the Terzaghi equation yields an allowable gross bearing capacity of approximately 1,800 lbs/ft<sup>2</sup> for a five-foot wide footer. This calculation is presented in Appendix D.

#### 2.1.2 Moisture Content

The moisture content of a soil sample is determined by measuring the wet weight of the sample, oven-drying the sample, and measuring the dry weight of the sample after oven-drying. The moisture content of a soil is calculated as the ratio of the weight of water in a soil sample to the weight of dry soil in the sample. The moisture contents of the coal ash samples vary from 15.9 percent to 112.4 percent.

Determination of the in-situ moisture content of the coal ash is necessary to establish the moisture-density relationship of the material. For this coal ash, knowledge of the moisture content may also aid in determining the amount of moisture the material may sorb, which may influence treatment, disposal, or reuse options.

Based on the geologic descriptions and the laboratory test results, the coal ash present at this site is a dry material, but has a moisture content varying from approximately 16 to 110 percent. Samples collected from depths of 20 to 28 feet in boring MW-3 are described as dry, but have moisture contents of up to approximately 110 percent, which is greater than the moisture content of a typical soil. Coal ashes resulting from lower combustion technologies often have a high internal porosity, which allows the material to sorb a relatively large amount of water before becoming saturated and free water may accumulate in the pore spaces.

### 2.1.3 Moisture/Density Relationship

Proctor Tests are used to determine the relationship between moisture content and dry density of a soil for construction. That relationship is typically used to graphically determine the maximum experimentally obtainable dry density of a soil sample. The addition of moisture to soil increases workability and facilitates compaction, but when too much water is present, it will begin to "float" the soil particles, thereby decreasing the density. Geological and geotechnical engineers define the optimum moisture content of a soil sample as the moisture content that corresponds to the maximum dry weight of that sample. These tests were conducted to acquire a preliminary assessment of the potential for constructability on the ash.

E 1 27E



The maximum dry densities of the coal ash samples collected during drilling vary from 66.7 to 98.7 pounds per cubic foot (pcf). The optimum moisture contents of the same coal ash samples vary from 19.5 to 38.1 percent.

### 2.1.4 Organic Content

The organic content of a soil sample is determined by measuring the dry weight of a soil sample, removing the organic matter in the sample by ignition, and measuring the dry weight of the sample after ignition. The organic content of a soil is the ratio of the weight of organic material (as determined by ignition) in a representative sample to the weight of dry soil in the sample. The organic contents of the coal ash samples vary from 28.8 percent to 37.9 percent.

The organic content of a coal ash consists chiefly of unburned coal. Therefore, an analysis by the loss-on-ignition method yields an estimate of the carbon content of the ash. Ash generated by low-technology combustion systems will typically contain more unburned coal than ash generated by higher-technology combustion systems. The amount of carbon in the ash could influence potential reuse options. For example, typical electric utility coal ash is often reused in concrete applications, either as an admixture with Portland cement or as an aggregate, chiefly because of its pozzolanic properties. A pozzolan is a siliceous or aluminous-siliceous material that has little or no cementitious properties itself, but when finely divided and in the presence of moisture, will react with calcium hydroxide to form compounds that are cementitious. Carbon, however, is known to have a deleterious effect on the strength of concrete because it sorbs large quantities of free water from the mix, inhibiting the formation of cementitious compounds. Consequently, coal ash containing a significant amount of unburned coal is not well suited for this use.

Six ash samples were analyzed for organic carbon by the loss on ignition method. The results ranged from approximately 29 percent to 38 percent. This coal ash is not well suited for concrete applications because of this high percentage of unburned coal. The relatively high carbon content suggests that the ash may have application in soil stabilization or slurry walls, where the water and/or organic compound sorption potential of the ash may be utilized.

### 2.1.5 Atterberg Limits

The Atterberg Limit test results are used in the classification of cohesive soils. The Atterberg Limit tests provide two index parameters: the liquid limit, w<sub>l</sub>, and the plastic limit, w<sub>p</sub>.

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The liquid limit is the water content, by weight, at which the clayey soil begins to behave as a viscous liquid. The plastic limit is the water content, by weight, at which the clayey soil begins to behave as a plastic. Most naturally occurring cohesive soils exist in the plastic state. The plasticity index,  $l_p$ , is defined as the range of water content over which the soil exhibits plastic behavior and can be calculated by subtracting the plastic limit from the liquid limit.

These three terms provide qualitative measures of certain properties of cohesive materials, such as permeability, compressibility, and dry strength. There are several methods to estimate the undrained shear strength of clays based on the plasticity index. The liquid limit can be used in consolidation estimates.

The results of this investigation indicate that the ash is non-plastic, based on visual observations. Therefore, no Atterberg Limit tests were performed on ash samples. Atterberg Limits were conducted only on clayey samples collected from beneath the ash.

The liquid limits and plastic limits of the cohesive soil samples collected from the water table at MW-1 and MW-3 vary from 47 percent to 54 percent, and 17 percent to 19 percent, respectively. Additionally, the liquid limit and plastic limit of the clay sample collected from approximately 15 feet below the water table at DB-1 are 33 percent and 14 percent.

#### 2.1.6 Grain-Size Distribution

The grain-size distribution is necessary not only for classifying the soil (or ash), but also for predicting the behavior of a soil under certain conditions, such as a soil's liquefaction potential under cyclical or vibratory stresses. The grain-size distribution allows for a more accurate SPT blowcount correlation (fine sand versus coarse sand), and provides guidance for determining whether blowcount correlations are applicable; correlations based on SPT data are generally more applicable to granular materials rather than cohesive, or clayey, materials.

The grain-size distribution may be necessary in determining potential reuse options for the coal ash. For example, if a potential reuse option is to use the ash as a fine aggregate in a low-strength structural fill, it may need to meet established particle-size distributions for that application.

Grain-size analyses were conducted on six ash samples. The grain-size distribution of the ash particles can be described as generally fine sandy silt with a trace of coarse sand to fine gravel. Blowcount correlations are likely a reasonable estimate of the material's in-place strength because based on the grain-size distribution and visual observations, the ash is likely to behave as a cohesionless, granular material.



The Michigan Department of Transportation (MDOT) Standard Specifications for Construction (1990), Table 8.02-4 Grading Requirements for Fine Aggregates, lists no more than 20 percent passing a number 100 sieve (fine sand) and no more than 10 percent loss by washing. The grading requirements for granular materials (MDOT, 1990, Table 8.02-3) requires no more than 35 percent passing a number 100 sieve for Class IIA granular material, and no more than 15 percent loss by washing for a Class III granular material. The loss by washing is essentially the fraction of particles that pass the number 200 sieve (silt-sized particles), and is so named because the procedure requires a washing of the number 200 sieve to facilitate the passage of silt-sized particle through this fine mesh.

Based on the limited number of grain-size analyses conducted for this project, the ash at this site consists of approximately 70 percent silt. Therefore, the generally fine (silt-sized) particle size may limit potential use as an aggregate, unless the coarser fraction is separated from the fines, which may be cost prohibitive, or applications are identified in which grain-size distributions are less restrictive.

### 2.2 CONE PENETROMETER TESTING

After the soil borings were completed at MW-1, MW-2, and MW-3, STS advanced a cone penetrometer device to approximately the same depth as the geotechnical boring. The cone penetrometer is a standard method employed to collect a continuous or nearly continuous record of in-situ geotechnical properties of soils. It was employed to supplement the SPT and laboratory testing. At MW-1, a layer of debris was encountered at approximately 20 feet bgl and the cone penetrometer device was refused. At MW-2, the cone penetrometer test was abandoned at approximately 22 feet bgl because the device deflected excessively (greater than 14 degrees) from plumb.

During each cone penetrometer test, the following measurements were made every 0.8 inches from ground surface to the total test depth:

- Tool depth
- Tip resistance
- Friction sleeve resistance
- Probe inclination
- Induced dynamic pore pressure



STS averaged and reported these measurements every six inches, such that approximately seven readings were averaged into each reported measurement.

STS used current correlation methods to derive the following from the cone penetrometer test measurements:

- Soil behavior types
- Equivalent Standard Penetration Test (SPT) N values
- Corrected equivalent SPT N1 values
- Drained friction angle for sands
- Relative density for sands
- Undrained shear strength for clays
- Cyclic Stress Ratio for Clean Sand

The STS cone penetrometer test report is presented in Appendix E. An interpretation guide prepared by STS for the cone penetrometer test data and correlation methods is presented in Appendix F.

### 2.2.1 Soil Behavior Types

Soil behavior types are graphically determined by correlating tip resistance and friction ratio values to historically recorded values in Midwestern soils. The soil behavior types that were identified by STS in the coal ash are generally sandy silt, silt, clayey silt, silty clay, and sensitive fines, but a few thin zones with sand and silty sand behavior were also identified.

### 2.2.2 Standard Penetration Test (SPT) - N Values

The equivalent Standard Penetration Test (SPT) – N values correlated from the cone penetrometer data (in the coal ash) range from 2 to 16 blow counts per foot. The N values within the ash are generally less than 10. This corresponds to the 1 to 10 blow count range observed in the SPT field measurements.

### 2.2.3 Corrected Equivalent Standard Penetration Test - N1 Values

The corrected (depth-normalized for over-burden stress) equivalent SPT - N1 values correlated from the cone penetrometer data (in the coal ash) range from 2 to 20 blow counts per foot.



### 2.2.4 Drained Friction Angle for Sands

The drained friction angle values for sands (non-cohesive soils) correlated from the cone penetrometer data (in the coal ash) range from <30 to 46 degrees. Drained friction angle values between 30 and 48 degrees are reported to the nearest degree. Those values below 30 are reported as <30 degrees.

### 2.2.5 Relative Density for Sands

The relative density for sand (normally consolidated, uncemented, unaged, moderately incompressible quartz sands and sand/silt mixtures) is a measure of the density of a sample relative to experimentally obtained minimum and maximum densities for that sample. The relative density values for sands correlated from the cone penetrometer data (in the coal ash) range from <40 to 64 percent. Relative density values between 40 and 90 percent are reported to the nearest percent. Those values below 40 and above 90 percent are reported as <40 and >90 percent.

### 2.2.6 Undrained Shear Strength for Clays

The undrained shear strength values for clays (cohesive soils) correlated from the cone penetrometer data (in the coal ash) range from 0.18 to 3.26 tons per square foot (tsf) or 360 to 6,520 pounds per square foot (psf).

### 2.2.7 Cyclic Stress Ratio for Clean Sand

The cyclic stress ratio (CSR) for clean sand is an estimate of the cyclic shear strain generated during a cyclic (generally seismic) event that is required to liquefy a soil. The CSR is expressed as a ratio of the cyclic shear stress required to induce liquefaction to the effective overburden stress. The values of CSR for clean sand correlated from the cone penetrometer data (in the coal ash) range from 0.05 to 0.25.

### 2.3 ENVIRONMENTAL COAL ASH AND SOIL SAMPLING

Coal ash or soil samples were collected from each of three intervals in the DB-1, MW-1, MW-2, and MW-3 geotechnical borings. The three intervals were from 4 to 6 feet below ground level (bgl), 14 to 16 feet bgl, and just above the water table (varied from 20 to 28 feet bgl). The samples were collected with a split-barrel sampler. The upper two samples from each location

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were collected from the coal ash, which was generally a dry, dark gray to black, fine-grained material (comparable to silt) with a trace amount of coarse-grained cinders (comparable to coarse sand to fine gravel). The deepest sample collected from each location was collected from the native soil underlying the coal ash. These soils are well sorted, generally rounded fine to medium sands.

In addition to the samples collected from the four geotechnical borings, samples were collected from the 1.5- to 2-foot bgl interval in the GSI-1, GSI-2, GSI-3, and GSI-4 environmental soil borings.

All of the samples were submitted to the MDEQ Environmental Laboratory in Lansing, Michigan to be analyzed for volatile organic compounds (VOCs), pesticides, polychlorinated biphenyls (PCBs), Michigan 10 scan of metals, and base/neutral and acid extractable compounds (BNAs). VOCs samples were collected using the methanol extraction method. The soil sampling analytical data are summarized in Table 1.

Lead was detected at 7,250,000 µg/kg in the MW-3-26-28' sample (i.e., MW-3, the 26 to 28 foot sample). This concentration exceeds several Part 201 Generic Cleanup Criteria for soil: the Drinking Water Protection Criterion of 1,000 µg/kg, the Statewide Default Background Level of 21,000 µg/kg, and the Direct Contact Criterion of 400,000 µg/kg. Tetrachloroethene (PCE) was detected in the MW-1-4-6' and MW-3-4-6' sample intervals at 150 µg/kg and 140 µg/kg, respectively. The PCE concentrations exceed the MDEQ Part 201 Generic Residential Cleanup Criteria for Drinking Water Protection of 100 µg/kg, but were flagged by the MDEQ Laboratory as estimated or not accurate. PCE was not detected in soils at MW-1 and MW-3 at the deeper soil sampling intervals. Soil sample analytical results exceeding one or more Part 201 Generic Residential Cleanup Criterion from these locations/intervals are summarized on Figure 2. The complete MDEQ Laboratory data reports are presented in Appendix G.



### 3.0 GROUNDWATER INVESTIGATION

After the completion of each geotechnical boring at the MW-1, MW-2, and MW-3 locations, a groundwater monitoring well was installed in the open borehole. Four groundwater/ surface water interface (GSI) monitoring wells were installed in the GSI-1, GSI-2, GSI-3, and GSI-4 boreholes. Well construction logs are included in Appendix A.

### 3.1 MONITORING WELL INSTALLATION

The three groundwater monitoring wells were installed such that the approximately two feet of each 5-foot long well screen was above the water table. Each of the 10-slot (0.010-inch openings) well screens is constructed of polyvinyl chloride (PVC) and is attached to the bottom end of a PVC riser pipe. The PVC risers were installed to approximately three feet above ground level.

The borehole annuli were filled with Badger-brand artificial sandpack from the bottom of the borehole to two feet above the screen. A 2-foot thick plug of hydrated bentonite chips was installed above the well screen and the remainder of each annulus was filled with a bentonite slurry grout to three feet below ground level.

A 7-foot long, 4-inch diameter steel protective casing was set over each riser pipe to approximately four feet below ground level. A 1-foot layer of hydrated granular bentonite was placed above the slurry grout to support a 2-foot thick concrete pad that was installed around the steel protective casing. Each steel protective casing was secured with a keyed-alike lock.

In addition to the three groundwater monitoring wells, four groundwater – surface water interface (GSI) monitoring wells were installed in the GSI-1, GSI-2, GSI-3, and GSI-4 boreholes. The wells were installed such that approximately one foot of each 3-foot long screen was above the water table. Each of the 10-slot (0.010-inch openings) well screens is constructed of polyvinyl chloride (PVC) and is attached to the bottom end of a PVC riser pipe. The PVC risers were installed to approximately one foot above ground level and secured with a locking, expandable plug and a keyed-alike lock.

The GSI well boring annuli initially filled to the water table with saturated collapse soils. The annuli were filled with Badger-brand artificial sandpack to approximately one foot below ground level. The annuli were then filled to ground level with hydrated granular bentonite.



### 3.2 GROUNDWATER INVESTIGATION

On February 25, 2000, and July 26, 2000, Malcolm Pirnie staff collected groundwater samples from each of the seven groundwater monitoring wells at the site. Monitoring well GSI-2 was not sampled on July 26, 2000 because it was apparently vandalized (i.e., the well casing was pulled up from the ground and the well screen was clogged with bentonite). On August 9, 2000, Malcolm Pirnie staff resampled MW-1 and submitted the sample to the MDEQ laboratory for analysis for BNAs to confirm prior results. This is discussed further in Section 3.2.2.

Upon arrival at the site for each sampling event, each well was opened to the atmosphere to allow the water level in each well to equilibrate to current conditions. After each well had equilibrated, the depth to the static water table was measured from the top of the well casing. The depth to water measurements and the subsequently surveyed top of casing elevations were used to calculate the water table elevation in each monitoring well. The monitoring well survey and water level data are presented in Table 2. The potentiometric surface maps presented on Figures 3 and 4 were developed from the water table elevations calculated for each sampling event. The groundwater flow direction is generally east, towards the Kalamazoo River. On February 25, 2000, the hydraulic gradient varied from approximately 0.002 ft/ft to 0.0004 ft/ft from the north end to the south end of the site. On July 26, 2000, the hydraulic gradient varied from approximately 0.003 ft/ft to 0.002 ft/ft from the north end to the south end of the site.

Before collecting groundwater samples, a minimum of three well casing volumes of water was purged from each well. Purging and bailing were conducted using disposable bailers.

#### 3.2.1 February 25, 2000 Results

Groundwater samples were submitted to the MDEQ Environmental Laboratory in Lansing, Michigan to be analyzed for VOCs, pesticides, PCBs, Michigan 10 scan of metals, and BNAs. The groundwater sampling analytical data are summarized in Table 3. The groundwater sampling analytical data that exceed one or more MDEQ Part 201 Generic Residential Drinking Water Cleanup Criteria are presented on Figure 5. The complete MDEQ Laboratory data reports are presented in Appendix H.

Vinyl chloride was detected in the samples collected from MW-1 and GSI-4 at concentrations of 48 µg/l and 78 µg/l, respectively. These concentrations exceed the MDEQ Part 201 Generic Residential Drinking Water Cleanup Criteria of 2.0 µg/l. Bis (2-ethylhexyl) phthalate was detected in the sample collected from MW-1 at 6.8 µg/l. This concentration



exceeds the MDEQ Part 201 Generic Residential Drinking Water Cleanup Criterion of 6.0 µg/l. No concentrations of pesticides, PCBs, or metals exceeding the Drinking Water Cleanup Criteria were detected in the samples.

### 3.2.2 July 26, 2000 and August 9, 2000 Results

Groundwater samples were submitted to the MDEQ Environmental Laboratory in Lansing, Michigan to be analyzed for VOCs, pesticides, PCBs, and the Michigan 10 scan of metals. On August 9, 2000, a sample was collected from MW-1 and submitted to the laboratory to be analyzed for BNAs. The August 9 sample was collected to verify the presence of bis (2-ethylhexyl) phthalate because it is a common laboratory contaminant and it was detected in the February 2000 groundwater sample collected from MW-1. The groundwater sampling analytical data are summarized in Table 3. The groundwater sampling analytical data that exceed the MDEQ Part 201 Generic Residential Drinking Water Cleanup Criteria are presented on Figure 6. The complete MDEQ Laboratory data reports are presented in Appendix I.

Vinyl chloride was detected in the samples collected from MW-1 and GSI-4 at 160  $\mu$ g/l and 80  $\mu$ g/l, respectively. These concentrations exceed the MDEQ Part 201 Generic Residential Drinking Water Cleanup Criteria of 2.0  $\mu$ g/L. Bis(2-ethylhexyl) phthalate was not detected in the sample collected from MW-1. No concentrations of pesticides, PCBs, or metals exceeding the Part 201 Generic Residential Drinking Water Cleanup Criteria were detected in the samples.

### 3.3 SUMMARY OF GROUNDWATER INVESTIGATIVE RESULTS

PCE was not detected in groundwater samples at the site (Table 2). It is possible that PCE leaching from site soils/coal ash may have resulted in the presence of the vinyl chloride detected in groundwater samples, as vinyl chloride can be a breakdown product of PCE under certain site conditions. However, the following items suggest that this may not have occurred in this case:

- No PCE, intermediate breakdown products, or vinyl chloride were detected in deeper soil samples at MW-1 (Table 1).
- PCE data in soil were "J" flagged by the MDEQ laboratory. This means "estimated value or value not accurate".
- The high carbon content of the coal ash present at this site may strongly sorb non-polar organic compounds, such as PCE.



If vinyl chloride observed in groundwater does not originate from an on-site source, an upgradient source to the south/southeast is a possibility.

Lead was not detected in groundwater samples at the site above applicable Part 201 Generic Residential Cleanup criteria (Table 2). This is most notable at MW-3, where a soil sample was collected from 26 to 28 feet below ground level (bgl) with a lead concentration of 7,285,000  $\mu$ g/kg was detected, as discussed above. The ground surface elevation in the area of MW-3 is 782.3 feet above mean sea level (AMSL). Thus, the elevation of the soil sample interval is from 756.3 to 754.3 feet AMSL. The observed water table elevations at MW-3 during the groundwater sampling events discussed above were 753.90 and 753.41 feet, respectively. These elevations are within a foot of the 26 to 28 foot soil sample interval. The laboratory reported concentrations of groundwater samples collected at MW-3 were less than 1  $\mu$ g/L and 1.2  $\mu$ g/L in the February and July groundwater sampling events, respectively. These concentrations are less than the Part 201 Generic Residential Drinking Water Cleanup criterion, 4  $\mu$ g/L, which is the most restrictive potentially applicable groundwater criterion. The physical proximity of the 26-28 foot soil sample at MW-3 to the water table elevation, coupled with the low lead levels in the water obtained from MW-3 together do not suggest leaching of lead from the soil column into the groundwater.



### 4.0 GOVERNMENTAL RECORDS - RADIUS SEARCH

On November 16, 2000, Malcolm Pirnie obtained a governmental record radius search from Environmental Data Resources, Inc (EDR), at the request of MDEQ. The target location that was used for the radius search was the intersection of Ampersee Street and Sherwood Avenue.

According to the radius search report documentation, EDR consulted the following databases in preparation of the report:

### FEDERAL ASTM RECORDS

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priority List (NPL)
- Deletions from the National Priority List
- Comprehensive Environmental Response, Compensation, and Liability information System (CERCLIS)
- Deletions from CERCLIS due to No Further Action Planned (CERCLIS-NFRAP)
- Resource Conservation and Recovery Act (RCRA) Corrective Action (CORRACTS)
- Resource Conservation and Recovery Information System (RCRIS)
- Emergency Response Notification System (ERNS)
- Biennial Reporting System (BRS)
- CERCLA Consent Decrees (CONSENT)
- NPL Records of Decision (ROD)
- Facility Index System (FINDS)
- Hazardous Materials Information Reporting System (HMIRS)
- Material Licensing Tracking System (MLTS)
- Mines Master Index File (MINES)
- CERCLA Liens (NPLLIENS)
- PCB Activity Database System (PADS)
- RCRA Administration Action Tracking System (RAATS)
- Toxic Chemical Release Inventory System (TRIS)
- Toxic Substances Control Act (TSCA)



### STATE OF MICHIGAN ASTM RECORDS

- State Hazardous Waste Sites (SHWS)
- Solid Waste Facilities Database (LF)
- Leaking Underground Storage Tank Sites (LUST)
- Underground Storage Tank Facility List (UST)
- Aboveground Storage Tanks (AST)

### EDR PROPRIETARY DATABASES

- Former Manufactured Gas (Coal Gas) Sites
- Groundwater Flow (AQUIFLOW)

### HISTORICAL AND OTHER DATABASES

- Oil/Gas Pipelines and Electrical Transmission Lines
- Sensitive Receptors (i.e., schools, nursing homes, hospitals, etc.)
- Flood Zone Data from the Federal Emergency Management Agency (FEMA)
- National Wetlands Inventory (NWI) from the US Fish and Wildlife Service

The governmental record radius search report (EDR Radius Map with Geocheck®) is presented in Appendix J.



Malcolm Pirnie understands that the City of Kalamazoo and the State are greatly interested in the potential for redevelopment of this site. Toward that objective, the following conclusions can be drawn based on the geotechnical and analytical data obtained during this investigation:

- The environmental data identify the site as a "facility" under Part 201 of 451 PA
  1994, as amended, because PCE, lead, and vinyl chloride were detected above the
  Part 201 Generic Residential Cleanup Criteria for soil or groundwater. Although
  bis (2-ethylhexyl) phthalate was detected above the Part 201 Generic Residential
  Drinking Water Cleanup Criteria in the sample collected from MW-1 on February 25,
  it was not detected in the sample collected on August 9, 2000. The presence of bis
  (2-ethylhexyl) phthalate may be attributable to laboratory equipment contamination
  because it is a common laboratory contaminant. Because of the "J" flag associated
  with the PCE results in soil/ash samples, the site may or may not be a facility for
  PCE. However, data clearly support the facility designation through the presence of
  lead in soil and vinyl chloride in groundwater.
- Environmental concerns may limit coal ash reuse options. The presence of concentrations of PCE and lead in soil/coal ash samples exceeding Part 201 Generic Residential Cleanup Criteria may limit reuse options, and potentially necessitate Due Care responsibilities under Part 201.
- Based on the SPT and CPT data, the relative density of the coal ash is less than 40 percent. Convention dictates that footings are not placed on cohesionless materials that exhibit a relative density of less than 50 percent. Local building codes may specify certain minimum relative densities required of foundation soils. If left in place, the ash will need to be densified to make a suitable foundation material for conventional footers.
- Based on the SPT and CPT data, the coal ash has a low bearing capacity in its present condition. Preliminary approximations of bearing capacity suggests that the ash may be capable of supporting light foundations, once the ash has been suitably improved to meet relative density criteria.
- Moisture content data and visual descriptions suggest that the ash has a large capacity to sorb water. The ash contains a relatively large percentage of water (from 20 to 110 percent, by weight) with respect to a typical granular soil, yet is visibly dry, and has a capacity to sorb additional water without becoming saturated.
- Loss on ignition test data indicate that the coal ash has an organic content of greater than 30 percent. This suggests that the ash is not well suited for reuse as a cement or concrete admixture.



- The loss on ignition test data indicates that the ash may be suitable for use in soil stabilization or slurry wall applications. The relatively high, unburned carbon content may provide sorptive properties that are well suited for these applications.
- Grain-size analyses indicate that the coal ash comprises approximately 70 percent silt, 25 percent fine sand, and less than 5 percent coarse sand to fine gravel. This suggests that the ash will have limited options for use as an aggregate unless the ash is separated into multiple fractions. This operation is likely to be cost prohibitive because of the relatively small volume of coarser materials observed in the borings conducted during this investigation. Without such separation, the ash may be suitable as a low-strength structural fill in an application that does not prohibit a large fraction of fine material. For reference, the MDOT Standard Specifications for Construction (1990), Table 8.02-4 Grading Requirements for Fine Aggregates, lists no more than 20 percent passing a number 100 sieve (fine sand) and no more than 10 percent loss by washing.
- The results of the moisture-density analyses indicate that the maximum dry density and optimum moisture content of the ash is variable. The two analyses yielded maximum dry densities of 71 and 98 lbs/ft<sup>3</sup>, and corresponding optimum moisture contents of approximately 32 and 21 percent. Because the in-situ moisture content of the ash samples often exceeded these optimum moisture contents, but was visibly dry, it is likely that there is little correlation between moisture content and maximum dry density in this range of moisture. The ash's affinity for sorbing water likely reduces the amount of free water available in the system that would facilitate compaction.

### 6.0 RECOMMENDATIONS

Based on our understanding of the intended development of the site and preference for reuse of the ash, if feasible, we have included a general outline and discussion of issues that may need to be considered. The development of the former Consumers Power site may proceed along a number of paths. Any development option must consider the desired site use, applicable regulations (including environmental regulations), existing site conditions, and appropriate site remedial or site development methods required to achieve the end result. Although this investigation has indicated that the ash present on this site is loose and generally unsuitable as a foundation soil in its present condition, there are site improvement and construction methods that could be implemented to allow construction on the ash. To properly select the best option, a detailed feasibility and cost analysis, which is beyond the scope of this project, would need to be conducted.

It is Malcolm Pirnie's understanding that the City of Kalamazoo would prefer to have the site regraded to elevations commensurate with surrounding properties and construct multi-story, multi-family housing units using conventional spread footers or slab foundations. With this understanding, Malcolm Pirnie recommends the following general procedure.

- 1. Assess the potential environmental requirements associated with developing the site for residential use. The limited environmental sampling conducted during this investigation indicates that concentrations of PCE and lead exceed one or more MDEQ Part 201 Generic Residential Cleanup Criteria for soils, and that vinyl chloride concentrations exceed the Part 201 Generic Residential Drinking Water Cleanup Criteria. These issues may limit redevelopment potential and should be addressed through a site-specific Part 201 Remedial Action Plan (RAP). At a minimum, additional sampling of the ash may be required to delineate the extent of PCE and lead contamination to evaluate response options and potential reuse of uncontaminated ash. The current or future owners of the site also need to consider their Due Care responsibilities under Part 201.
- 2. <u>Evaluate Applicable, or Relevant and Appropriate Requirements (ARARs).</u> The scope of this investigation included assessment of limited environmental and geotechnical properties of site soils/ash and groundwater. Additional state or federal requirements may also affect the nature of any site or ash reuse alternatives selected.
- 3. Provided that there are no environmental issues precluding site development for residential use, investigate potential reuse options for the ash. Our understanding is that the City of Kalamazoo would prefer to regrade the site commensurate with surrounding properties; therefore, some ash removal will be necessary. Comparison of existing topography with historical topographic maps indicates that the site is currently approximately fifteen to twenty feet higher than the neighboring properties. The boring



logs indicate that the ash is approximately twenty to twenty five feet thick across the site. Therefore, for the purpose of this discussion, we will assume that the City will require the removal of at least the upper fifteen feet of ash across the 7.5 acre site, which is approximately 5,000,000 cubic yards of material.

The removed ash will need to either be disposed at an appropriate facility or marketed for reuse in an appropriate application. Behr-Andres (1991) developed a general protocol for determining reuse options for coal ash that would serve as a guideline for the evaluation of the potential for reuse of the ash on site. Behr-Andres (1991) also presents an extensive list of documented applications of coal ash reuse in construction products, structural fill, agricultural applications, and materials recovery. A synopsis of a few of the more conventional reuse options of electric utility coal ash is presented below.

- A. Soil or waste stabilization/solidification: This application takes advantage of the pozzolanic and/or sorptive properties of the coal ash. As the preliminary characterization data indicates, the ash at this Consumers Power site will likely exhibit little pozzolanic activity, but does have capacity to sorb water and organic compounds.
- B. Slurry walls: Most conventionally used to contain groundwater contamination, this application takes advantage of sorptive properties of coal ash. The coal ash at this Consumers Power site has demonstrated a capacity to sorb water and its high carbon content suggests that it would be well suited for the sorption of organic compounds.
- C. Soil amendment for agricultural applications: Electric-utility ashes have been used as liming agents to neutralize acidic soils, to improve the water-holding capacities of coarse, sandy soils, and to provide micronutrients such as calcium, sulfur, boron, molybdenum, and selenium. In some cases, however, high concentrations of heavy metals have limited the application of coal ash to soils.
- D. Low-strength structural or general fill: Including applications as a base or sub-base aggregate in road construction, this is one of the most common reuse options for coal ash. The very fine particle size of the ash at this site, however, will limit this option. It may be possible to screen out the coarser fraction for this use (which may amount to less than ten percent of the entire volume of ash, and therefore may not be cost effective) or to blend the ash with a coarse aggregate to achieve an acceptable grain size distribution for a particular application (which may amount to a low ash:aggregate blending ratio, and may not be cost effective).
- E. Concrete, brick, or asphalt admixture: Electric utility coal ash has long been used as an admixture or raw material in these applications because of its pozzolanic properties and fine, spherical particles (which improves the workability of the concrete). As the preliminary characterization data



indicate, however, the high carbon content of the coal ash at this site likely precludes its use as a concrete or concrete block admixture. This material may still be suitable for use in asphalt.

- F. Rotary kiln processes: Because of the carbon content, the coal ash may be suitable for use as a supplemental fuel/raw material in rotary kiln processes to generate slag, which may in turn have use as a lightweight aggregate for concrete applications. The carbon would be consumed in the process, and the resulting product may be more suitable for use in concrete or concrete block applications.
- Once the potential reuse options have been evaluated, assess whether to remove some 4. or all of the ash. Removing all of the ash from site would necessitate bringing in off-site fill materials to grade the site and establish a subgrade for building foundations. Unless a marketable reuse option for the ash is identified, it may be more economical to leave several feet of ash across the site. During site preparation for construction, the ash could be regraded and compacted to appropriate density. Conventional compaction of cohesionless soils is typically conducted using smooth-wheel, vibratory rollers over lift depths of up to 5 to 6 feet (Bowles, 1988). Based on the historic topographic maps of the area, it appears that the native soils are approximately five feet below the elevation of the surrounding properties. Therefore grading and compacting approximately five feet of ash in place it may be an economical means of achieving final grades commensurate with the surrounding properties, provided that the native soils just below the ash do not present settlement issues. The ash removed from the site would require off-site disposal or reuse. Potential reuse options are described under Item 3. If reuse is not desirable or feasible, the ash will likely require further characterization as part of a site-specific Part 201 RAP.
- 5. <u>Structural/Design engineers also have several options available to prepare the site for construction</u>. Because the ash has a low relative density, it is not suitable for construction in its present condition. Structural/Design engineers have three basic options to develop and build on the site: remove the ash, modify the ash, or bypass the ash. Removal and reuse of the ash would likely be the most economical option if there are no environmental barriers to reuse and a marketable use can be identified. In the event that reuse is not feasible and removal/disposal is cost prohibitive, construction could still be accomplished by one of the following methods:
  - A. Conventional compaction in five to six-foot lifts. This was discussed under Item
    4. This option is likely only feasible in the event that the upper fifteen to twenty feet of ash is removed from site.
  - B. Dynamic compaction. This is accomplished by dropping a weight from a fixed height over a gridded area. To offer some perspective regarding the potential effort involved in this procedure, we may assume that the entire ash thickness of 25 feet requires compacting. The weight and height of drop can be estimated from the equation:

 $D = 0.5(Wh)^{0.5}$ 

(Bowles, 1988)



Where D = depth (in meters)

W = weight (in metric tonnes)

H = height of drop (in meters)

So, for D = 8 meters (25 feet),

 $Wh = (8/0.5)^2 = 256$ 

And for a drop height of 10 meters, a weight of approximately 25 metric tonnes (approximately 55,000 pounds) would be required. Dynamic compaction is typically designed for depths of approximately twice the proposed footing width, and the grid spacing is typically set at 5 to 10 feet. Under ordinary circumstances, dynamic compaction is most economically feasible on areas of approximately one to three acres, when soil depths limit the economic feasibility of excavation and replacement, and when vibrations from the compactive effort will not damage nearby structures.

C. Vibration. The methods most commonly used to densify cohesionless soils are vibrofloatation and the insertion/retrieval of vibrating piles. These techniques, however, are typically employed on soils with less than 20 percent silt and 10 percent clay. The coal ash present at this site is cohesionless (no clay), but it is composed of approximately 70 percent silt-sized particles.

Vibrofloatation involves jetting water under pressure into the soils, creating a zone of liquefaction that causes the soil to settle under its own weight. The water eventually drains from the material. Because of the sorptive capacity of the fly ash at this site, vibroflotation may not be an effective procedure. The use of vibrating piles may be viable at this site, although the particle-size distribution of the ash contains more silt-size particles than would be typical, because the material, though fine, does not exhibit the plasiticity normally associated with silts and clays. Use of either method would require field tests to determine the effectiveness of the process and if effective, to determine the optimum grid spacing.

D. Foundation Grouting. Grouting consists of injecting or otherwise inserting a stabilizing agent into the soil under pressure. The stabilizing agent typically reacts with the soil and/or itself to create a stable mass. Typical grouts consist of a cement-based slurry. Lime and fly ash are also commonly used in these applications.

The fly ash on site may or may not be suitable as a stabilizing agent by itself. Typical electric utility fly ash exhibits pozzolanic properties, but as the preliminary characterization data suggests, this coal ash may contain too much

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carbon to be an effective pozzolan. The injection of a lime or cement slurry may be a viable stabilization option at the site, though in-situ stabilization methods are typically expensive.

E. Deep Foundation Piles. Buildings could be constructed using deep piles to transmit the building loads into a denser material. This is another technique that is commonly employed. Use of piles is more expensive than conventional spread footers, but it may reduce costs associated with extensive site pre-development in the event that excavation and removal of the ash is not economically feasible. This investigation identified a relatively dense sand that may provide a suitable foundation material at a depth of approximately 30 to 35 feet below grade (approximately ten feet below the bottom elevation of the coal ash).



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# TABLE 1 CONSUMERS POWER SITE SOIL SAMPLING ANALYTICAL DATA FEBRUARY 18-22, 2000

1	MW-1	MW-1	MW-1	MW-2	MW-2	MW-2	MW-3	MW-3	MW-3	DB-1	DB-1	DB-1	GSI-1	GSI-2	GSI-3	GSI-4
	4-6'		24-26		14-16'			14-16'	1	4-6'	14-16	24-26	1.5-2	1.5-2	1.5-2	115-2
Lead	1	· · · · · ·							7,250,000		1	2.20	1.0 2	1.0 =		1.0 2
Tetrachloroethene	\$150J	<u> </u>		<del> </del>			MAOJR				<del> </del>				<u> </u>	<b></b>
Naphthalene				260	260				<del> </del>		<u> </u>		240		<del>                                     </del>	<del></del>
2-Methylnaphthalene				340T	200T								170T,J	1	<del>                                     </del>	
Phenanthrene	1	<u> </u>		-	170	67T					<del> </del>		650		520	580
Flouranthene				<del> </del>		120							960		680	980
Pyrene				<b> </b>		110							970	<del>                                     </del>	640	1200
Chrysene				1		84T							600	<del> </del>	320	730
Anthracene	1	1		†					· · · · · · · · · · · · · · · · · · ·				280		150T	190
Acenapthylene													150T			200
Benz(a)anthracene			1					<del></del>					510		300	640
Benzo(b)flouranthene						<u> </u>							560			730
Benzo(k)flouranthene													410T			710
Benzo(a)pyrene													640		340T	970
Indeno(1,2,3-cd)pyrene		1	1													340T
Benzo(g,h,l)perylene				1												320T
Arocior 1242(PCB)					1			410								
Aroclor 1254(PCB)								180							<u> </u>	<u> </u>
Aroclor 1260(PCB)	1	<u> </u>	T	260								L		<u> </u>	ļ	<b> </b>
Bis(2-ethylhexyl)phthalate					850									<u> </u>		<u> </u>
Chloroform											150	<u> </u>			<u> </u>	<u></u>

NOTES: All concentrations reported in ug/kg.

Only compounds detected at or above method detection limit are presented.

Shaded cell - Analyte detected at or above MDEQ Part 201Generic Residential

Drinking Water Cleanup Criterion.

Blank cell - Analyte not detected at or above method detection limit.

T - Value reported is less than the criterion for detection.

J - Value is estimated or not accurate.

# TABLE 2 CONSUMERS POWER SITE MONITORING WELL SURVEY AND WATER LEVEL DATA FEBRUARY 25, 2000 AND JULY 26, 2000

	Northing	Easting	Ground Surface (feet AMSL)	Top of Casing (feet AMSL)	February 2000 Depth to Water (feet)	February 2000 Water Table Elevation (feet AMSL)	July 2000 Depth to Water (feet)	July 2000 Water Table Elevation (feet AMSL)
MW-1	292449.7	12797318.4	777.7	780.76	27.02	753.74	27.69	753.07
MW-2	292477.4	12797757.3	778.2	781.23	27.36	753.87	27.82	753.41
MW-3	293098.8	12797700.6	782.3	785.95	32.05	753.90	32.54	753.41
GSI-1	293082.0	12797505.1	753.9	755.50	1.86	753.64	2.57	752.93
GSI-2	292935.0	12797486.7	755.0	756.48	2.77	753.71	5.25	751.23
GSI-3	292755.6	12797362.9	754.6	755,97	2.33	753.64	3.25	752.72
GSI-4	292529.3	12797179.9	755.4	756.75	3.09	753.66	4.01	752.74
DB-1	292808.5	12797593.5	780.5	na	na	na	na	na

NOTES: AMSL - Above Mean Sea Level

During July 26, 2000 site visit GSI-2 was observed to be apparently vandalized.

# TABLE 3 CONSUMERS POWER SITE GROUNDWATER SAMPLING ANALYTICAL DATA FEBRUARY 25, 2000 AND JULY 26, 2000

•	3.4\A/	<del></del>	MW-		MW	2	GSI-1		GSI-2		GSI-3		GSI-4	
1	MW- February												· · · · · · · · · · · · · · · · · · ·	
	2000	July 2000	February 2000	July	February		February	July	February		February	July	February	July
Vinyl Chloride	2000			2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
cis-1,2-Dichloroethene	2.7	WHO IN								ns		ļ	480種	# 80 E
1,1-Dichloroethane	2.1	4.7						<b></b>		ns				
Toluene	<b></b> _i	1.7	7.4		<u> </u>					ns				2.3
Ethylbenzene	·							ļ	<b></b>	ns				
m&p-Xylene			2.3		ļ			<b></b>		ns		<b></b>		
			7.8			ļ		<b></b>	<u> </u>	ns		<b>.</b>	<b></b>	L
o-Xylene			3.2	ļ						ns		ļ		
1,3,5-Trimethylbenzene			1.7		<u> </u>				L	ns			<u></u>	
1,2,4-Trimethylbenzene			5.1							ns				
Flouranthene				na		na	0.8T	na		ns	1.2	na		na
Pyrene				na		na	1,1	na		ns	1.1	na		na
Aroclor 1254(PCB)							0.16	0.14		ns	0.16	0.07 T		
Bis(2-ethylhexyl)phthalate	(金)800		2.0	na	2.1	na	2.1	na		ns		na		na
Di-n-octyl phthalate	3.3			na		na		na		ns		na		na
Diethyl phthalate			1	na		па		na		ns	1.6	na		na
2-Methyl-4,6-dinitrophenol				na		na	3.6T	na		ns		na		na
Arsenic by Furnace	12.2	17	10.5	25	3.2	4.4	9.2	4.4		กร	2.8	1.6	1.8	2.3
Barium	124	119 DL	174	196 DL	207	257 DL	306	337 DL	193	ns	250	286 DL	190	156 DL
Copper by Furnace			25		1.5	1.2	10.6			ns		1.7		4.4
Lead by Furnace	1.0		1.2		1.2	1.2	1.4	1.1		ns	2.8	3.3		1
Selenium							1.6		2.5	ns	13			
Zinc	18	13	19	12	21	27	34			ns	15	16	13	13

NOTES: All concentrations reported in ug/L.

All metals analyses are dissolved.

Only compounds detected at or above method detection limit are presented.

Shaded cell - Analyte detected at or above MDEQ Part 201Generic Residential

Drinking Water Cleanup Criterion.

Blank cell - Analyte not detected at or above method detection limit

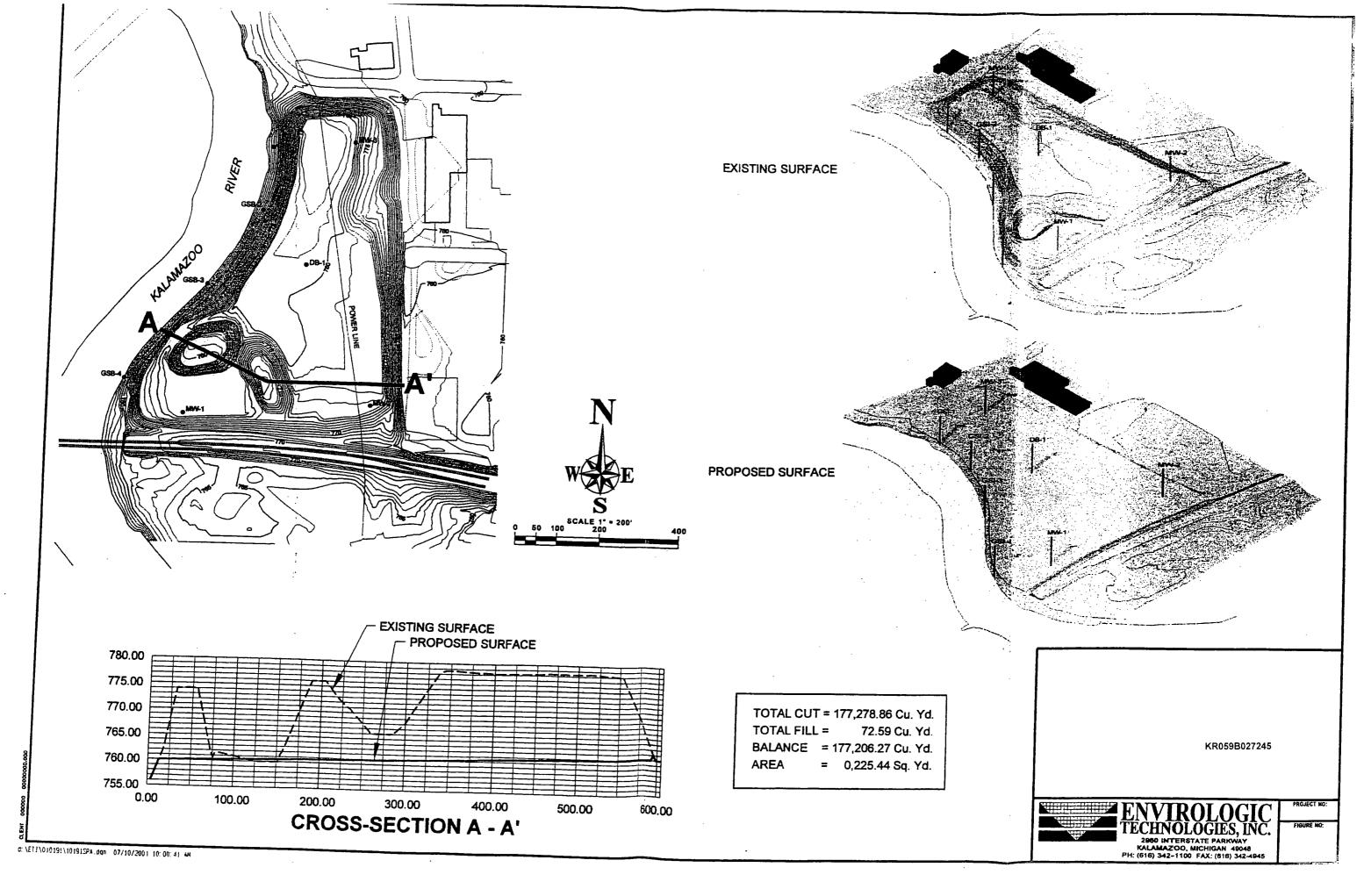
T - Value reported is less than the criterion for detection.

ns - Sample not collected because GSI-2 was apparently vandalized.

na - Analysis not performed because of Insufficient sample volume.

MW-1 sample for BNA analyses was collected on August 9, 2000.

DL - Dilution required.





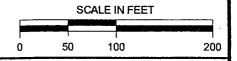
MONITORING WELL



SOIL BORING

### **NOTES**

- 1. STREET LOCATIONS ARE APPROXIMATE.
- 2. BASE MAP SOURCE: TOPOGRAPHIC SURVEY DATA SUPPLIED BY CITY OF KALAMAZOO.
- 3. THIS DRAWING MAY BE REPRODUCED FOR USE BY THE STATE OF MICHIGAN OR ITS AUTHORIZED REPRESENTATIVE.



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DATE: APRIL 2000

PATH/FILENAME: \2420141\DWG\LR 2000\CPDBASE.DWG

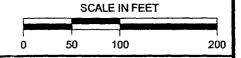
# SITE BASE MAP

**CONSUMERS POWER SITE** KALAMAZOO, MICHIGAN

- MONITORING WELL
- SOIL BORING

### **NOTES**

- 1. STREET LOCATIONS ARE APPROXIMATE.
- 2. BASE MAP SOURCE: TOPOGRAPHIC SURVEY DATA SUPPLIED BY CITY OF KALAMAZOO.
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### SOIL SAMPLING ANALYTICAL DATA

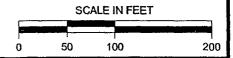
FEBRUARY 18-20, 2000

**CONSUMERS POWER SITE** KALAMAZOO, MICHIGAN

MONITORING WELL

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PATH/FILENAME: \2420141\DWG\LR 2000\CPPOT1.DWG

## POTENTIOMETRIC SURFACE MAP

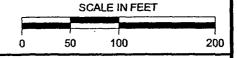
FEBRUARY 25, 2000

CONSUMERS POWER SITE KALAMAZOO, MICHIGAN

**MONITORING WELL** 

### **NOTES**

- 1. STREET LOCATIONS ARE APPROXIMATE.
- 2. BASE MAP SOURCE: TOPOGRAPHIC SURVEY
- 3. THIS DRAWING MAY BE REPRODUCED FOR USE BY THE STATE OF MICHIGAN OR ITS AUTHORIZED REPRESENTATIVE.



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DATE: NOVEMBER 2000

PATH/FILENAME: \2420141\DWG\LR 2000\CPPOT1.DWG

### POTENTIOMETRIC SURFACE MAP

JULY 26, 2000

**CONSUMERS POWER SITE** KALAMAZOO, MICHIGAN

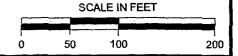
KR059B027249



MONITORING WELL

### NOTES

- 1. STREET LOCATIONS ARE APPROXIMATE.
- 2. BASE MAP SOURCE: TOPOGRAPHIC SURVEY
- 3. ALL CONCENTRATIONS ARE IN ug/l.
- 4. THIS DRAWING MAY BE REPRODUCED FOR USE BY THE STATE OF MICHIGAN OR ITS AUTHORIZED REPRESENTATIVE.



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# **GROUNDWATER SAMPLING ANALYTICAL DATA**

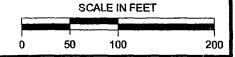
FEBRUAR / 25, 2000

CONSUMERS POWER SITE KALAMAZOO, MICHIGAN

MONITORING WELL

### **NOTES**

- 1. STREET LOCATIONS ARE APPROXIMATE.
- 2. BASE MAP SOURCE: TOPOGRAPHIC SURVEY
- 3. ALL CONCENTRATIONS ARE IN ug/l.
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PATH/FILENAME: \2420141\DWG\LR 2000\CPGWJUL00AD.DWG

### **GROUNDWATER SAMPLING ANALYTICAL DATA**

JULY 26, 2000

**CONSUMERS POWER SITE** KALAMAZOO, MICHIGAN



### **APPENDICES**



# APPENDIX A Soil Boring and Monitoring Well Construction Logs

COL	M PIRNIE					WEL	L / BORING LOG				
ORIN	۷G #: MW -	WE	ELL #:mu	J-1	Ţ	SITE NAME	: Consiners Power	-	PRO.	JEC	T#: 2420-141-420
DU	ND ELEV.:	ררר	1.7	TOC	EI	LEV.:780.76			<u>L</u>		
JN	TY: Kalam	a200	TWP: C	+m .f	·	(alamazo S	ECTION: T:	R:		1/4:	1/4:
RILL	CO.: ST	5	DRILLEF	7.7B.1	12	ako-ski D	RILLING RIG CME 550		PRILL TYP	PE:	Solid Stem / 41/4 HSA
<b>PRIN</b>	G START:	Z-1					LOCATION SKETCH (not to	•		<u>د</u> م	r-z ,
LL:	START:	2-19				2-19-00	mr-3	B3-(		_	
ATE	R FIRST: 2	242,	AT COM	PLET	10	N: 24'	] ⊗	$\langle \mathcal{P} \rangle$		(X	<del>+</del>
CREE	N FROM:	24	TO: Z	9 1			·	_			100
E:	PVC		SIZE:			1056+					TVK
SIN	G TYPE:	PYC	DIAMETE	ER:	Z	1,	N			٠.	₩-1 <b>+</b> '
/EAT	HER:	30° S	Sw. w.							~	9 +
				•				Rive			<u> </u>
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				_ _	$\perp$	<u> </u>					
	MW-1A	SS	1411-1" 12" out 1 3lov	اد	L		SILT/ C Smo) ~5-076 (- Suno	(54)	1		BLACK STATING OF CLOSES
	(8-24PE)	~44"Z.	13.22 - 32.	-	┸	1	270165 - <u>ASH</u> 15-m 20075				,- C42B03 -
	MW-13	55	1-2-2-1		L	DEY, GOLY &	7 ABOVE . TEC MSAND - SIZE	(SM)			SOME BLACK STANKING
	(248.2 Spes)	~6"2	<u>ــــــ</u>	丄	L	THE F ROO	75. ~10-15% WHITE GRANS		ł		
		55	W-1'	F'-	I	, ,	HE. THEK GOLY	(Sm)			THE BLACK STANDING
_ 🕖	MW-16	~ 12"R.	1-1	1_	┸		Genera /c Samo				The core symme
	m - 10	55	1-1-2-3		_	Der, 41 400	K. Gren Mercan, Bur -2" Limite	(145)			н
	2+8.2	~HU'R	ļ	+-	╀	-107. F-	O-SIND CINES/HARD ASIA	<b>X</b> ( )			
	M21-16	. 55	2-3-2-3	1	L	DRI/DAM AT	4904. C.C 6-3120 Cimposs L) TOP no"- Man ~3-4" 51-52.	(SH)			11
B	2×803	M8" R		/_	Ļ	Con 12, 7	M BLACK - 1 -107 waste 45, Tecas 5-5.	2			
	MM- 16	55	2-2-2-2	1	L	TOP ~~="	BLACK, 51 - 6- SAND SIZEP, DAMP	(5-1)			MULL BACK TO
	2~8,2	ML"Z			1	3m -65'-	624-1-15-20- word 5: Hy CS 51200	124-5-5	z		JONE BLUE BANG
	7m-16	53	6-1-21-1	1	L	A5 B	מאבות די	547		1	SL. BLACKISH ST
	148.7	214"		4_	L		5-CG FIND CIMPLES				
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<u>(4)</u>	EN { 1 40 -1	~14"	<u> </u>		L		- 1 ~ 20% with the Sun Find Teres	(34)			TRE Buse Bry
	かい江	55	M-1-1-1		Н		ACK, SILM - 32,	54)			
	14802	~12".		+	Н		4 WIMPE, Silly From SAMOY-512				Sever non Buck, Sims Lowers
	MN-1 J	55	W-1-1-3		Н	· ·	AS Born ABOIL - (GRAY, CAMESTA)	(ins		ĺ	
	1 - 802	~1Z"		20'-	Н		luntaes (1/4.1/4") Dx, LT Gary				Strae country FS will - Being
	12-1 K	55	2-3-2-4	1	Н			(sw			PL. OF ORNORSH RUSSUR
		2/2" 2			Н	780 ~8-5"	F-c 5/G 31700 CWZERS/AGI DIST, GERN-GON, ESMON SULVIRECE	en)		1	6 ~ 3-4 °
	MW-1 L	55	1-1-2-2	1	Н	MOIT / DONT .	GRAMISH GRAM WHEE DARK ORE ST.	NL NL	<del></del>		
·		-8.,5		+	H	Comov Si	UT TRAC SIND. MOD PUSTIC				
8	MW-1 M	55	3-5-5-7	25-	Н	70P ~6" A		nL		I	
	VOC4 , MET	~20" R			Н	3 m ~ 12-1	C MONT GOLGHUN M AND	57			
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<b>.</b>							ARU:	J3DUZ12	/ <del>**</del>	_	

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OLM PIRNIE		WELL / BORING LOG		
RING#: ww-3 WELL#	mw-3 SIT	TE NAME: Consumers Power	PROJEC	T #: 2420-141- Azo
UND ELEV .: 782.3		V.: 785.95   LOGGED BY: Hans Joh	hannes	
	: City of Kalen		R: 1/4:	1/4:
		sk. DRILLING RIG CME 550		Selid Stan 14/4
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mw-3- 55 1 1	-,1,1	AΔ	5m	
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WELL CONSTRUCTION LOG DATE: Z-Z2-66

BORING #: G51-1  WELL #:	G51-1	SITE NAME:	Con	54 ~~	~5	Pan	~	
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BENTONITE SEAL	0-1			•	$\vdash$	X	X	
CUTTINGS/NATURAL COLLAPSE		<del></del>			$\vdash$	X	X	Granular
ARTIFICIAL SANDPACK	1-4,				$\vdash$	5	X	Bentunite
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RING #: 651-3 WE					IPRO	)JEC	T#: 2420-141-420
UND ELEV 754		ELEV.: 755.9		Hans Joh.	سمدح		
MTY: Kalamazoo			ECTION: T:		₹:	1/4:	1/4:
ILL CO .: STS	DRILLER: BIT		RILLING RIG CHE			'PE:	
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REEN FROM: 14 2	TO: 4						
: PVC	SIZE: 10-510	<b>•</b>					
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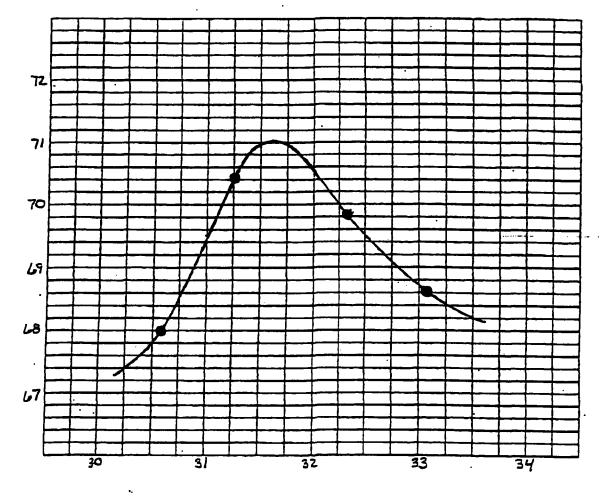
# APPENDIX B GEOTECHNICAL DATA



## MOISTURE - DENSITY RELATIONSHIP

			•		•			700000	
PROJECT	NAMEI	Consumers	Energy		STS	JDB 1	ND.: _	/3Z36AA	
SAMPLE I	ND.;	MW-1 (Fine)		Cl	LASSIFIC	ATION	1		
SAMPLE :	DESCRIP	TIDN:	Black sa	ody silt, to	ace fine gra	vel.			
SOURCE !	OF MATE	RIALI	M/-1			•			
NATURAL						•			
LIQUID L									
TEST PRE	JCEDURE	USED:	ASIM D	-1557, Metho	xd A				
MAXIMUM	DRY DEN	SITY_71.	O_PCF	DPTIM	ZIOM MUIS	TURE	CDN.	TENT_3	1.6 %
				AT A	WET DEN	YTIZ	DF_	93.4	_PCF

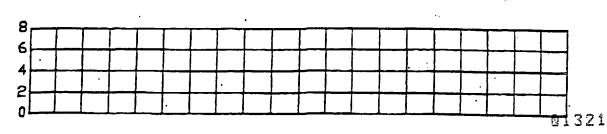
DRY DENSITY - LBS. PER CUBIC FOOT



KR059B027264

MOISTURE CONTENT - PERCENT OF DRY WEIGHT.

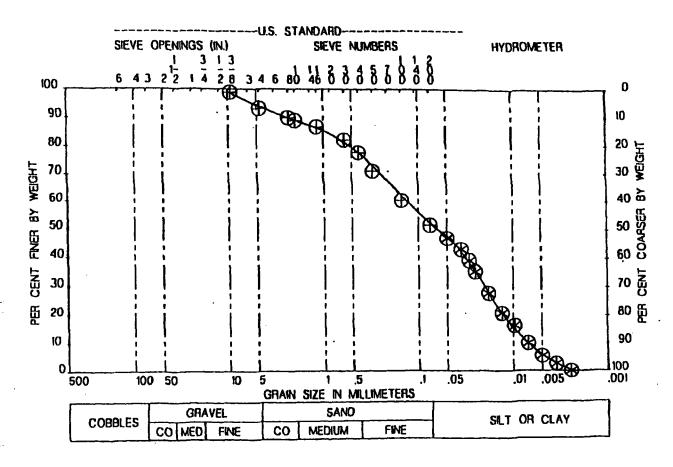
STRENGTH BY QP (TSF)



	0-2 2-4	67.1 20.2			
	6-8	20.2	34.4	*	
	8-10	33.2	34.4	-	·
MW-1	10-12	41.3			
	12-14	40.1			
	16-18	46.8			
	18-20	60.3	36.1	*	
	20-22	59.4	·		
	22-24				47-30-17/OH
	24-26			*	
	0-2	73.0			
]	2-4	72.8			
	6-8	15.9	6. F		
	8-10	35.4	31.5	*	
MW-2	10-12 12-14	41.2 43.7			
	16-18	54.8	36.9	14.	
	18-20	40.7	30.9	•	
	20-22	70.7			
	22-24	:		*	
	0-2	58.4			
1	2-4	29.7			
j j	6-8	46.9	37.9	*	
	8-10	45.0			
	10-12	45.2			
MW-3	12-14	56.0			
ĺ	16-18	62.5	20.0	:	
)	18-20	55.7	28.8	*	
	20-22 22-24	625 85.1			
	24-26	85.6			
[	26-28	112.4			
	28-30	*****			54-35-19 MH
	30-32			*	U- UU IV MIII
DB-1	38-40	-			33-14-19 CL

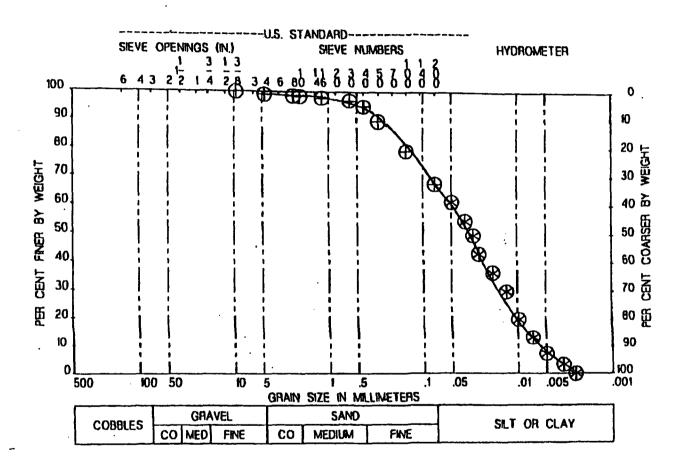


RAIN SIZE DISTRIBUTION (ASTM D 422) STS JOB NO.: 73256XA DATE: 03/21/00 LL: PL: PI: WC: 22.2 BP.GR.: 2.40 EST.



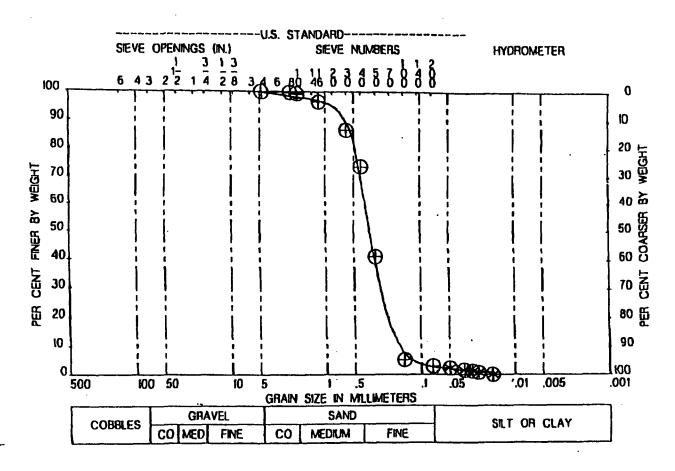


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STS JOB NO.: 73256XA
DATE: 03/21/00
LL: PL: PI:
WC: 60.3 SP.GR.: 2.40 EST.



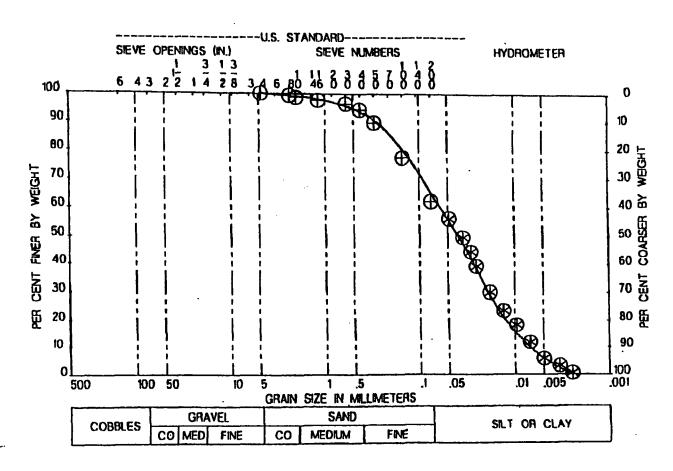


GRAIN SIZE DISTRIBUTION (ASTM D 422) STS JOB NO.: 73256XA PATE: 03/21/00



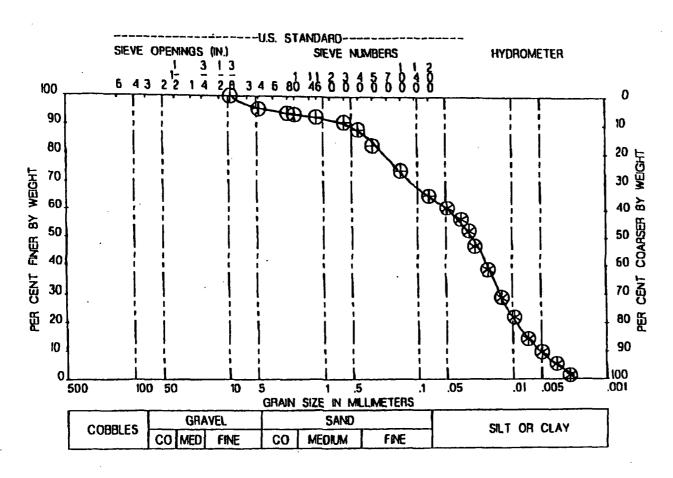


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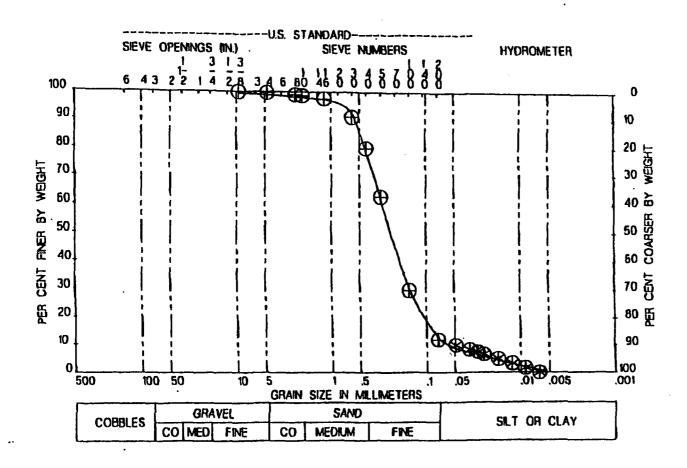
بر ارز GRAIN SIZE DISTRIBUTION (ASTM D 422) STS JOB NO.: 73256 A 7 PATE: 03/21/00 PI: WC: 54.8 SP.GR.: 2.40 EST.





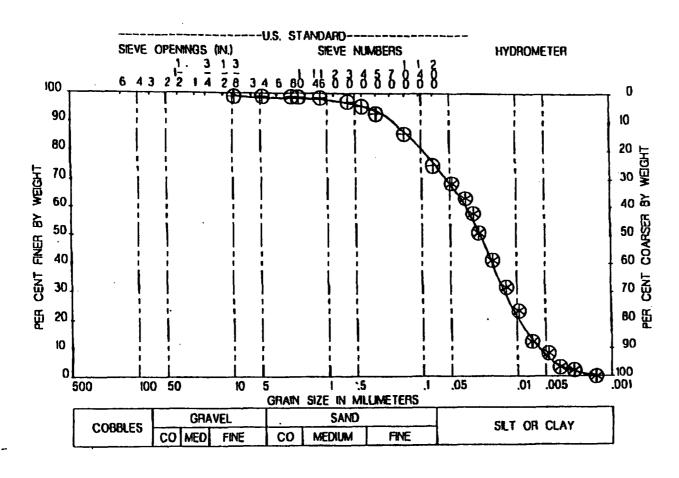
GRAIN SIZE DISTRIBUTION (ASTM D 422) STS JOB NO.: 73256XA PATE: 03/21/00

PL: Pl: SP.GR.: 2.70 EST.



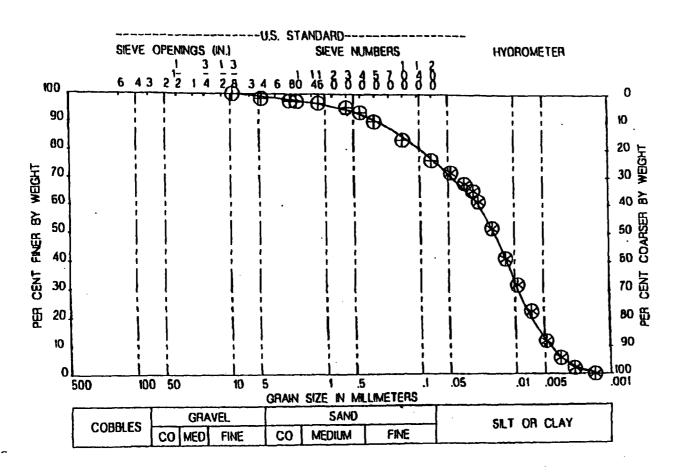


GRAIN SIZE DISTRIBUTION (ASTM D 422)
STS JOB NO.: 73256XA
PATE: 03/21/00
IL: PL: PL: PI:
WC: 46.9 SP.GR.: 2.40 EST.



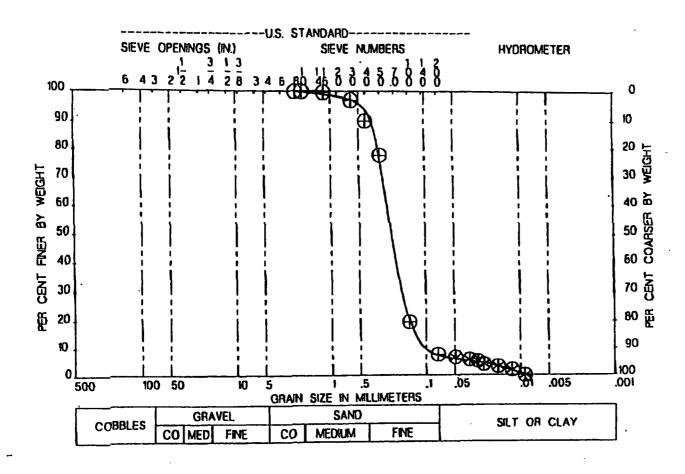


GRAIN SIZE DISTRIBUTION (ASTM D 422) STS JOB NO.: 73266XA DATE: 03/21/00 LL: PL: PL: PI: WC: 55.7 SP.GR.: 2.40 EST.





GRAIN SIZE DISTRIBUTION (ASTM D 422)
STS JOB NO.: 73256X4
DATE: 03/21/00
LL: PL: PI: PI:
WC: - SP.GR.: 2.70 EST.





# APPENDIX C SPT BLOWCOUNT CORRELATIONS

#### Calculate the Standardized SPT Blowcount

Seed, et al., (1985) and Riggs (1986) recommend the following standardized SPT equipment for use in the Simplified Procedure for Liquefaction Assessment:

Sampler:

Standard split-spoon sampler: OD = 2.00"; ID = 1.38"

Drill Rods:

A or AW for depths <50 feet; N or NW for depths >50 feet

Hammer:

Standard safety hammer: weight = 140 lbs; drop = 30"

(2,520 in-lbs; 60% of theoretical freefall)

Rope:

2 wraps around pulley

Borehole:

Hollow-stern augers, where SPT taken through the stem, or 4- to 5-in

diameter rotary borehole with bentonite mud for borehole stability

Drill Bit:

Upward deflection of drilling mud (tricone or baffled drag bit)

Blowcount Rate: 30 to 40 blows per minute

Penetration:

Measured over range of 6 to 18 inches of penetration into soil

If the equipment and procedures meet the above specifications,  $N = N_{60}$ , and only a correction for overburden pressure will be required.

Table C-2
Standardized SPT Blowcounts
Coal Ash and Underlying Deposits

Subsurface Investigation
Consumers Power Site, Kalamazoo, Michigan

Depth	N	C <sub>ht</sub>	C <sub>hw</sub>	C <sub>ss</sub>	$C_{rl}$	C <sub>bd</sub>	C <sub>60</sub>	N <sub>60</sub>
MW-1								
1	1	1.00	1.00	1.00	0.75	1.00	0.75	1
3	4	1.00	1.00	1.00	0.75	1.00	0.75	3
5	1	1.00	1.00	1.00	0.75	1.00	0.75	1
7	3	1.00	1.00	1.00	0.75	1.00	0.75	2
9	5	1.00	1.00	1.00	0.75	1.00	0.75	4
11	4	1.00	1.00	1.00	0.75	1.00	0.75	3
13	1	1.00	1.00	1.00	0.75	1.00	0.75	1
15	1	1.00	1.00	1.00	0.85	1.00	0.85	1
17	2	1.00	1.00	1.00	0.85	1.00	0.85	2
19	2	1.00	1.00	1.00	0.85	1.00	0.85	2
21	5	1.00	1.00	1.00	0.95	1.00	0.95	5
23	3	1.00	1.00	1.00	0.95	1.00	0.95	3
25	10	1.00	1.00	1.00	0.95	1.00	0.95	10
MW-2								
1	3	1.00	1.00	1.00	0.75	1.00	0.75	2
3	2	1.00	1.00	1.00	0.75	1.00	0.75	2
5	2	1.00	1.00	1.00	0.75	1.00	0.75	2
7	2	1.00	1.00	1.00	0.75	1.00	0.75	2
9	3	1.00	1.00	1.00	0.75	1.00	0.75	2
11	3	1.00	1.00	1.00	0.75	1.00	0.75	2
13	4	1.00	1.00	1.00	0.75	1.00	0.75	3
15	4	1.00	1.00	1.00	0.85	1.00	0.85	3
17	2	1.00	1.00	1.00	0.85	1.00	0.85	2
19	6	1.00	1.00	1.00	0.85	1.00	0.85	5
21	4	1.00	1.00	1.00	0.95	1.00	0.95	4
23	4	1.00	1.00	1.00	0.95	1.00	0.95	4
25	5	1.00	1.00	1.00	0.95	1.00	0.95	5

Table C-3
Normalized Standardized SPT Blowcounts
Coal Ash and Underlying Deposits

## Subsurface Investigation Consumers Power Site, Kalamazoo, Michigan

Depth (feet)	$N_{60}$	Depth to Water (feet)	γ <sub>soil</sub> (lbs/ft³)	σ <sub>v</sub> (psf)	σ <sub>v</sub> ' (psf)	C <sub>n</sub>	(N <sub>1</sub> ) <sub>60</sub>	N'70
MW-1								
1	1	26	120	120	120	4.08	3	3
3	3	26	120	360	360	2.36	7	6
5	1	26	120	600	600	1.83	1	1
7	2	26	120	840	840	1.54	3	3
9	4	26	120	1,080	1,080	1.36	5	4
11	3	26	120	1,320	1,320	1.23	4	3
13	1	26	120	1,560	1,560	1.13	1	1
15	1	26	120	1,800	1,800	1.05	1	1
17	2	26	120	2,040	2,040	0.99	2	1
19	2	26	120	2,280	2,280	0.94	2	1
21	5	26	120	2,520	2,520	0.89	4	4
23	3	26	120	2,760	2,760	0.85	2	2
25	10	26	120	3,000	3,000	0.82	8	7
MW-2								
1	2	26	120	120	120	4.08	9	8
3	2	26	120	360	360	2.36	4	3
5	2	26	120	600	600	1.83	3	2
7	2	26	120	840	840	1.54	2	2
9	- 2	26	120	1,080	1,080	1.36	3	3
11	2	26	120	1,320	1,320	1.23	3	2
13	3	26	120	1,560	1,560	1.13	3	3
15	3	26	120	1,800	1,800	1.05	4	3
17	2	26	120	2,040	2,040	0.99	2	1
19	5	26	120	2,280	2,280	0.94	5	4
21	4	26	120	2,520	2,520	0.89	3	3
23	4	26	120	2,760	2,760	0.85	3	3
25	5	26	120	3,000	3,000	0.82	4	3

C-5

Table C-4
Estimated Undrained Shear Strength
Coal Ash and Underlying Deposits

## Subsurface Investigation Consumers Power Site, Kalamazoo, Michigan

Depth (feet)	N'70	Soil	Clay Consistency	q <sub>u</sub> (psf)	c <sub>u</sub> (psf)
MW-1 23 MW-2	2	clay	soft	500	250
<i>MW-3</i> 29	2	clay	soft	500	250
<b>DB-1</b> 23 25 39	2 2 17	clay clay clay	soft very soft very stiff	500 500 4,250	250 250 2,125

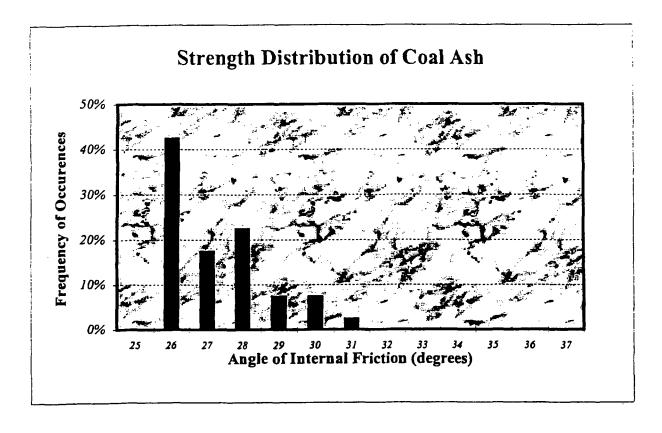
Table C-5
Estimated Angle of Internal Friction
Coal Ash and Underlying Deposits

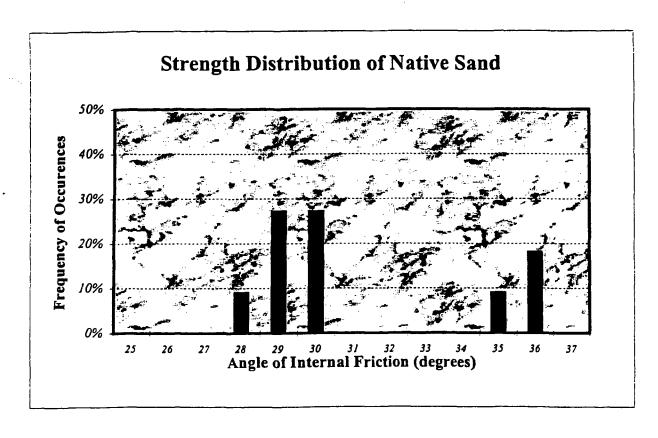
## Subsurface Investigation Consumers Power Site, Kalamazoo, Michigan

Depth (feet)	N'70	Predominant Grain Size	Density	Descriptio <b>n</b>	Relative Density (%)	Φ (°)
MW-3						
1)	10	fine	loose	coal ash	50%	31
3	2	fine	very loose	coal ash	8%	27
5	1	fine	very loose	coal ash	6%	26
7	1	fine	very loose	coal ash	5%	26
9	1	fine	very loose	coal ash	4%	26
11	2	fine	very loose	coal ash	8%	27
13	7	fine	loose	coal ash	39%	30
15	5	fine	very loose	coal ash	23%	29
17	1	fine	very loose	coal ash	7%	26
19	1	fine	very loose	coal ash	7%	26
21	1	fine	very loose	coal ash	4%	26
23	1	fine	very loose	coal ash	7%	26
25	1 }	fine	very loose	coal ash	7%	26
27	1	fine	very loose	coal ash	6%	26
29	2	clay	-	silty clay		
31	4	fine	very loose	sand	21%	29
DB-1						
5	1	fine	very loose	coal ash	6%	26
15	2	fine	very loose	coal ash	8%	27
21	1 (	fine	very loose	coal ash	7%	26
23	2	clay	·	silty clay	İ	
25	2	clay		silty clay	[ [	
27	5	fine	loose	sand	26%	29
29	4	fine	very loose	sand	22%	29
31	8	fine	loose	sand	42%	30
33	6	fine	loose	sand	29%	30
35	34	fine	dense	sand	85%	40
37	22	fine	medium dense	sand	68%	36
39	17	clay		silty clay		50
41	22	fine	medium dense	sand	68%	36
43	20	fine	medium dense	sand	66%	35

C-9

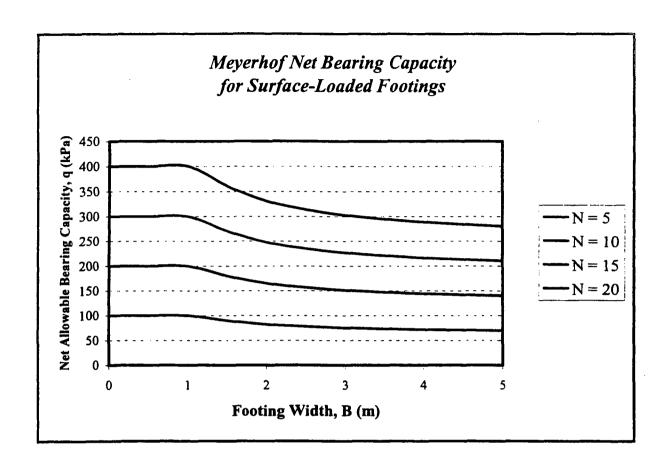
Figure C-1
Consumers Power Site, Kalamazoo, Michigan







# APPENDIX D BEARING CAPACITY ESTIMATES



#### Notes:

- 1. For surface-loaded footings with settlement limited to approximately 25 mm (1 inch).
- 2. Depth-factor adjustment (for sub-surface footings):

$$q_a = q_a * (1 + 0.33*D/B)$$
 for D > 0

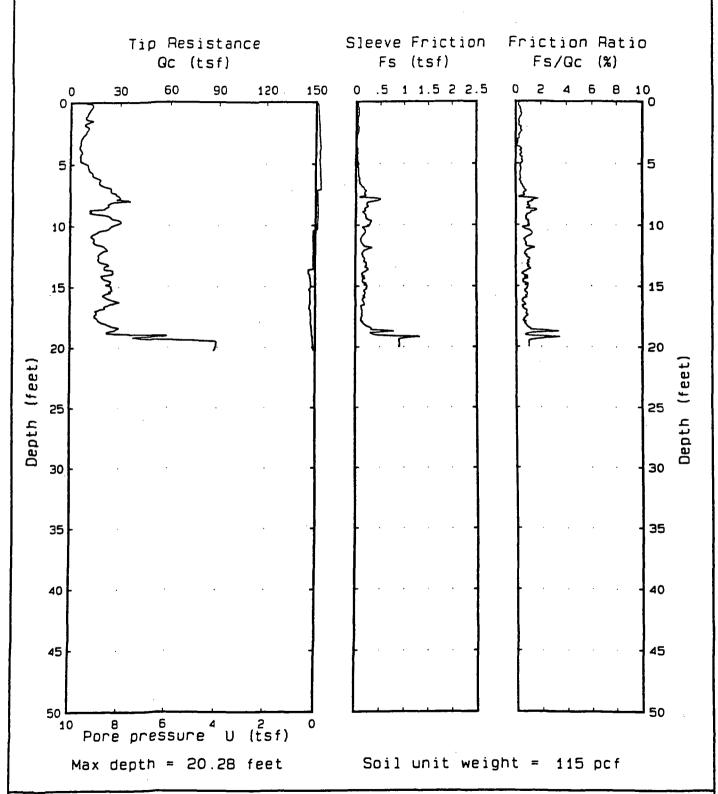
- 3. N shown in approximately N<sub>55</sub>.
- 4. 1.0 kPa is approximately 20 lbs/ft<sup>2</sup>.



#### APPENDIX E

STS CONSULTANTS, LTD.
CONE PENETROMETER REPORT

## Consultants, Ltd



#### STANDARD CONE PENETROMETER TEST DATA

Client: MALCOLM PIRNIE Project: CONSUMERS POWER

S.W SIDE

Site: Date:

02-20-00 13: 37

KR059B027285

Filename: MALC01.CPT Cone id: H52~P10 Sounding: CPTU-01 (RE)

Proj. no: 73256-XA

R1842

### STS Consultants, Ltd

Database filename: MALCO1.CPT

Client: MALCOLM PIRNIE

Project name: CONSUMERS POWER

Project number: 73256-XA Site: 5.W SIDE

Sounding number: CPTU-01 (RE)
Test date: 02-20-00 13:37

Cone ID: H52-P10 Water table: NONE

Soil unit weight: 115 PCF (ASSUMED)

Test engineer: JBD Dissipation: NONE

Comment: CME-550 RIG WAS USED FOR CPT TESTING
Comment: TEST WAS PERFORMED 5 FT NORTH OF MW-01

Comment: TEST ENDED AT 20 FT DUE TO HIGH INCLINATION

Comment:

#### STANDARD CONE PENETROMETER ANALYSIS REPORT

Depth ..... Depth to tip of come

Tip ...... Tip resistance

Sleeve ..... Local sleeve friction
Incl ...... Deviation from vertical

Pore ...... Induced dynamic pore pressure (zero for standard cone)
Temp ...... Cone temperature (temperature cones only)
Ratio ..... Friction ratio (Sleeve / Tip) \* 100%

Mat. type .. Soil classification (Robertson & Campanella, 1983)

SPT N ..... Standard Penetration Test N value (Martin 1990)

SPT N1 .... N value corrected for overburden (Marcuson & Bieganousky, 1977)

Sigv' ..... Effective vertical overburden

Phi ...... Drained friction angle for sands (Robertson & Campanella, 1983)

Dr ...... Relative density of sands (Baldi 1982)

Su ....... Undrained shear strength of clays (Tip - Sigvtot) / Nk (Nk = 17.2) (R & C, 1989)

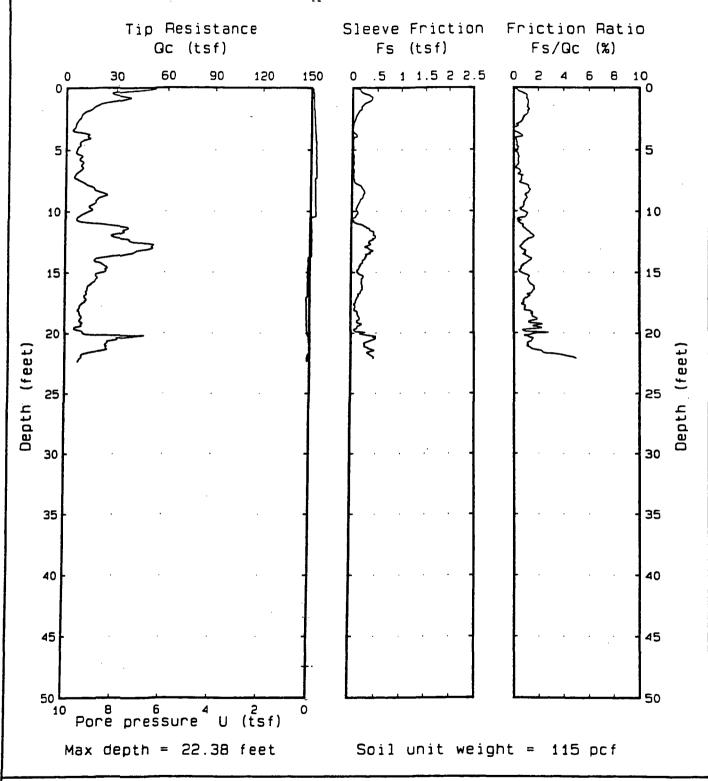
CSR ...... Cyclic Stress Ratio for clean sand (Seed & De Alba, 1986; M = 7.5)

All values are averaged and reported at an interval of .5 feet

KR059B027286

Depth (ft)	Tip (tsf)	Sleeve (tsf)	Incl	Pore (tsf)	Ratio (%)	Material Type	SPT N (bpf)	SPT N1 (bpf)	Sigv'	Phi (deg)	Dr (%)	Su (tsf)	CSR (dec)
0.25	12.1	0.03	0.1	-0.08	0.3	Sandy silt to clayey silt	5	9	0.01		44	0.70	0.10
0.75	10.9	0.05	0.1	-0.10	0.4	Sandy silt to clayey silt	5	B	0.04		42	0.63	0.09
1.25	9.5	0.04	0.1	-0.12	0.4	Sandy silt to clayey silt	4	7	0.07	42	40	0.55	0.08
1.75	9.9	0.03	0.1	-0.13	0.3	Sandy silt to clayey silt	4	7	0.10	41	< 40	0.57	0.08
2.25	9.9	0.04	0.1	-0.15	0.5	Sandy silt to clayey silt	4	. 8	0.13	40	< 40	0.57	0.09
2.75	7.3	0.02	0.1	-0.17	0.3	Sensitive fine grained	3 .	6	0.16			0.48	
3.25	5.9	0.01	0.1	-0.18	0.2	Sensitive fine grained	3	5	0.19			0.38	
Depth	Tip	Sleeve	Incl	Pore	Ratio	Material Type	SPT N	SPT N1	Sigv	Phi	Dr	Su	CSR
(ft)	(tsf)	(tsf)	(deg)	(tsf)	(%)	·	(bpf)	(bpf)	(tsf)	(deg)	(♦)	(tsf)	(dec)

## Consultants, Ltd



#### STANDARD CONE PENETROMETER TEST DATA

Client: MALCOLM PIRNIE
Project: CONSUMERS POWER
Site: S.E. SIDE

Date:

02-20-00 11:21

KR059B027287

Filename: MALCO2.CPT
Cone id: H52-P10
Sounding: CPTU-02 (RE)

Proj. no: 73256-XA

2:24

## STS Consultants, Ltd

Database filename: MALCO2.CPT

Client: MALCOLM PIRNIE

Project name: CONSUMERS POWER

Project number: 73256-XA
Site: S.E. SIDE
Sounding number: CPTU-02 (RE)
Test date: 02-20-00 11:21

Cone ID: H52-P10 Water table: NONE

Soil unit weight: 115 PCF (ASSUMED)

Test engineer: JBD Dissipation: NONE

Comment: CME-550 RIG WAS USED FOR CPT TESTING

Comment: TEST WAS PERFORMED 5 FT SOUTHWEST OF MW-02
Comment: TEST ENDED AT THE REQUIRED DEPTH OF 22.1 FT

Comment:

#### STANDARD CONE PENETROMETER ANALYSIS REPORT

Depth ..... Depth to tip of cone

Tip ..... Tip resistance

Sleeve ..... Local sleeve friction
Incl ...... Deviation from vertical

Pore ...... Induced dynamic pore pressure (zero for standard cone)
Temp ...... Cone temperature (temperature cones only)
Ratio ..... Friction ratio (Sleeve / Tip) \* 100%

Mat. type".. Soil classification (Robertson & Campanella, 1983)

SPT N ..... Standard Penetration Test N value (Martin 1990)

SPT N1 ..... N value corrected for overburden (Marcuson & Bieganousky, 1977)

Sigv' ..... Effective vertical overburden

Phi ...... Drained friction angle for sands (Robertson & Campanella, 1983)

Dr ...... Relative density of sands (Baldi 1982)

Su ....... Undrained shear strength of clays (Tip - Sigvtot) / Nk (Nk = 17.2) (R & C, 1989)

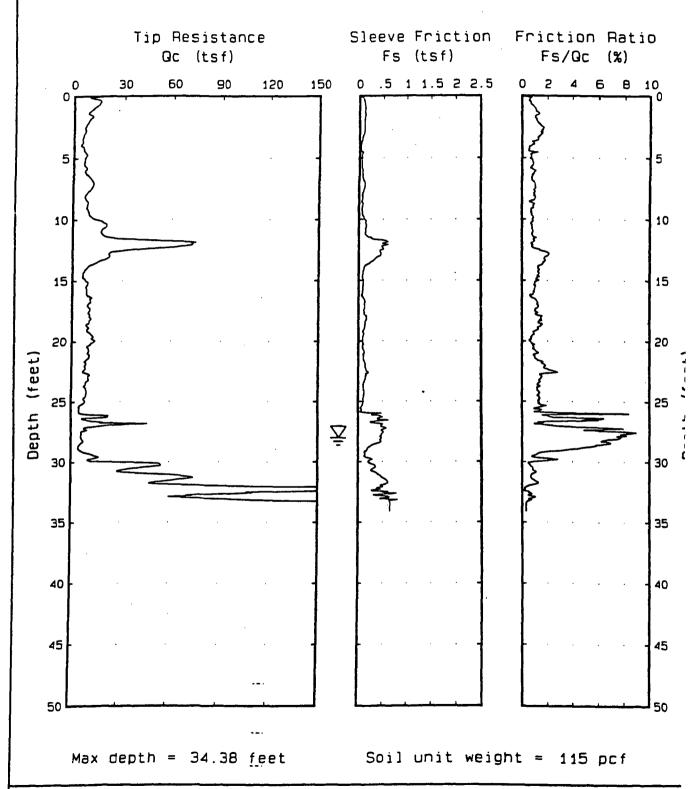
CSR ...... Cyclic Stress Ratio for clean sand (Seed & De Alba, 1986; M = 7.5)

KR059B027288

All values are averaged and reported at an interval of .5 feet

Depth (ft)	Tip (tsf)	Sleeve (tsf)	Incl (deg)	Pore (tsf)	Ratio (%)	Material Type	SPT N (bpf)	SPT N1 (bpf)	Sigv' (tsf)	Phi (deg)	Dr (%)	Su (tsf)	CSR (dec
0.25	40.1	0.15	2.6	-0.08	0.4	Sand to silty sand	11	20	0.01		64		0.23
0.75	34.1	0.36	1.6	-0.09	1.1	Silty sand to sandy silt	11	20	0.04		60	1.98	0.22
1.25	23.5	0.27	1.0	-0.10	1.2	Sandy silt to clayey silt	8	15	0.07	46	49	1.36	0.17
1.75	14.3	0.17	1.2	-0.11	1.2	Sandy silt to clayey silt	6	10	0.10	43	42	0.82	0.12
2.25	8.8	0.08	1.4	-0.13	0.9	Clayey silt to silty clay	4	7	0.13			0.50	
2.75	6.3	0.04	1.7	-0.14	0.6	Sensitive fine grained	3	6	0.16			0.41	
3.25	4.6	0.01	1.9	-0.16	0.1	Sensitive fine grained	2	4	0.19			0.29	
Depth	Tip	Sleeve	Incl	Pore	Ratio	Material Type	SPT N	SPT N1	; Sigv'	Phi	Dr	Su	CSR
(ft)	(tsf)	(tsf)	(deg)	(tsf)	(%)		(bpf)	(bpf)	(tsf)	(deg)	(%)	(tsf)	(dec)

#### Consultants, Ltd



#### PIEZOCONE PENETROMETER TEST DATA

MALCOLM PIRNIE Client: Project: CONSUMERS POWER N.E. SIDE Site:

02-20-00 10: 02 Date:

KR059B027289

Filename: MALCO3, CP Cone id: H52-H10 Sounding: CPTU-03 ( Proj. no: 73256-XA

## STS Consultants, Ltd

Database filename: MALCO3.CPT

Client: MALCOLM PIRNIE

Project name: CONSUMERS POWER

Project number: 73256-XA
Site: N.E. SIDE
Sounding number: CPTU-03 (RE)
Test date: 02-20-00 10:02

Cone ID: H52-H10 Water table: 28 FT

Soil unit weight: 115 PCF (ASSUMED)

Test engineer: JBD Dissipation: NONE

Comment: CME-550 RIG WAS USED FOR CPT TESTING
Comment: TEST WAS PERFORMED 5 FT SOUTH OF MW-03

Comment: TEST ENDED AT THE REQUIRED DEPTH OF 34.1 FT

Comment:

#### STANDARD CONE PENETROMETER ANALYSIS REPORT

Depth ..... Depth to tip of cone

Tip ..... Tip resistance

Sleeve ..... Local sleeve friction
Incl ...... Deviation from vertical

Pore ...... Induced dynamic pore pressure (zero for standard cone)
Temp ...... Cone temperature (temperature cones only)
Ratio ..... Friction ratio (Sleeve / Tip) \* 100%

Mat. type .. Soil classification (Robertson & Campanella, 1983)

SPT N ..... Standard Penetration Test N value (Martin 1990)

SPT N1 ..... N value corrected for overburden (Marcuson & Bieganousky, 1977)

Sigv' ..... Effective vertical overburden

Phi ...... Drained friction angle for sands (Robertson & Campanella, 1983)

Dr ..... Relative density of sands (Baldi 1982)

Su ....... Undrained shear strength of clays (Tip - Sigvtot) / Nk (Nk = 17.2) (R & C, 1989)

CSR ...... Cyclic Stress Ratio for clean sand (Seed & De Alba, 1986; M = 7.5)

All values are averaged and reported at an interval of .5 feet

KR059B027290

Depth (ft)	-	Sleeve (tsf)		Pore (tsf)	Ratio (%)	Material Type	SPT N (bpf)	SPT N1 (bpf)	Sigv'	Phi (deg)	Dr (%)	Su (tsf)	CSR (dec)
0.25	13.5	0.07	0.1	0.00	0.5	Sandy silt to clayey silt	5	10	0.01		45	0.78	0.11
0.75	13.4	0.11	0.1	0.00	0.8	Sandy silt to clayey silt	5	10	0.04		44	0.77	0.11
1.25	9.5	0.11	0.1	0.00	1.2	Clayey silt to silty clay	4	. 8	0.07			0.55	
1.75	10.0	0.11	0.1	0.00	1.1	Clayey silt to silty clay	4	8	0.10			0.57	
2.25	7.4	0.10	9.1	0.00	1.4	Clayey silt to silty clay	4	7	0.13			0.42	
2.75	6.3	0.10	9.1	0.00	1.6	Clayey silt to silty clay	3	6	0.16			0.36	
3.25	5.2	0.07	0.1	0.00	1.4	Sensitive fine grained	3	5	0.19			0.34	
Depth	Tip	Sleeve	Incl	Pore	Ratio	Material Type	SPT N	SPT N1	Sigv'	Phi	Dr	Su	CSR
(ft)	(tsf)	(tsf)	(deg)	(tsf)	<b>(%)</b>		(bpf)	(bpf)	(tsf)	(deg)	<b>(%)</b>	(tsf)	(dec)

atabas	e file	filename:		MALCO3.CPT		ge.							Page
Depth	Tip	Sleeve	Incl	Pore	Ratio	20Material Type	SPT N	SPT N1	Sigv'	Phi	Dr	 Su	<b>-</b>
(ft)	(tsf)	(tsf)	(deg)	(tsf)	(%)	•6	(bpf)	(bpf)	(tsf)	(deg)	(*)	(tsf)	(4
 27.25	9.6	0.51	4.5	0.00	5.3	Clay	6.	5	1.57			0.47	
27.75	6.0	0.48	4.6	0.00	8.0	Clay	5	4	1.60			0.25	
28.25	6.6	0.45	4.8	0.00	6.8	Clay	5	4	1.62			0.29	
28.75	4.5	0.24	4.9	0.00	5.3	Clay	3	3	1.63			0.17	
29.25	9.0	0.14	5.1	0.00	1.6	Clayey silt to silty clay	4	4	1.64	••		0.43	
29.75	14.6	0.21	5.6	0.00	1.4	Sandy silt to clayey silt	6	5	1.66	< 30	< 40	0.75	0
30.25	50.7	0.31	5.7	0.00	0.6	Sand to silty sand	14	11	1.67	35	< 40		0
30.75	35.2	0.32	5.9	0.00	0.9	Silty sand to sandy silt	11	9	1.68	32	< 40	1.94	0
1.25	67.5	0.48	6.1	0.00	0.7	Sand to silty sand	17	14	1.70	36	< 40		0
1.75	59.7	0.57	6.3	0.00	1.0	Sand to silty sand	16	13	1.71	36	< 40		o
2.25	158.6	0.43	7.0	0.00	0.3	·- Sand	29	23	1.72	41	63		0
2.75	80.8	0.55	8.2	0.00	0.7	Sand to silty sand	19	15	1.73	37	< 40		. 0
3.25	150.4	0.63	8.3	0.00	0.4	Sand	29	23	1.75	40	61		0
3.75	217.4	0.66	8.7	0.00	0.3	. Sand	37	28	1.76	. 42	76		0
4.06	216.0	0.66	8.8	0.00	0.3	I. Sand	36	28	1.77	42	75		0
epch		Sleeve		Pore	Ratio	Material Type	SPT N	SPT N1	Sigv'	Phi	Dr	Su	
(ft)	(tsf)	(tsf)	(deg)	(tsf)	(*)	•	(bpf)	(bpf)	(tsf)	(deg)	<b>(%)</b>	(tsf)	(6

Maximum test depth = 34.12 feet

KR059B027291



### APPENDIX F

STS CONSULTANTS, LTD.
CONE PENETROMETER TEST INTERPRETATION GUIDE

#### Tabular Printouts

Each CPT test includes a summary printout of information for each test. The summary printout includes all header information associated with the test as well as tabulated columns of the averaged collected data and interpreted geotechnical parameters as a function of depth.

The tabular printouts contain the measured cone readings and values of geotechnical parameters which are averaged over a selectable depth increment. Cone readings in the Appendix are averaged and reported at 0.5 foot intervals. Since data is recorded every 0.8 inches (2 cm), approximately 7 or 8 readings are averaged in each 0.5 foot interval.

All of the data which is recorded by the cone penetrometer is reported in the first five columns of the tabular printout. This data consists of the depth in column one, the tip resistance  $(q_c)$  in column two, the friction sleeve resistance  $(f_s)$  in the third column, the inclination of the probe in column four, and the induced dynamic pore pressure (U) in column five. These field collected values are edited and corrected as needed in the office to eliminate possible sources of error.

The remainder of the tabular printout contains information which is derived from the cone readings through the use of soil correlations. STS uses the current state-of-the-art in cone correlations to produce soil behavior types, equivalent SPT N values, corrected equivalent SPT  $N_1$  values, drained friction angle (phi) for sand, relative density  $(D_r)$  for sand, and undrained shear strength  $(s_u)$  of clays. The methods used to determine these correlations are outlined below.

It should be recognized that these soil correlations are derived for average soils from data which is collected world-wide. Engineering judgement must be used in determining whether a correlation is applicable to specific site and soil conditions. The inclusion of a correlated parameter in the printout does not imply that the correlation is suitable for a specific site. References for these correlations are listed in the tabular printout and are also listed at the end of this Procedure.

#### Pore Pressure

The measured pore pressure is generally not the hydrostatic pore pressure, but rather a generated pore pressure due to the failing of the soil by the insertion of the penetrometer. This pore pressure tends to be much higher than hydrostatic in normally consolidated clays and silty clays due to the undrained failure. In loose sands or silts where drainage is quick, the measured pore pressure should be close to the hydrostatic value. Dense sands and silts or over-consolidated clays tend to produce negative pore pressures since these materials may actually dilate during shear.

KR059B027293

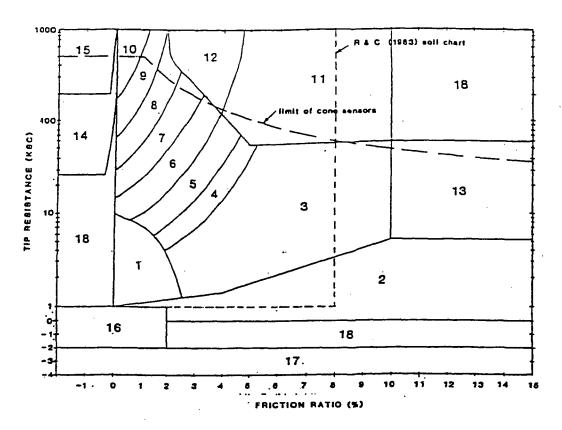
### Friction Ratio

Due to the geometry of the cone design, tip readings and friction sleeve readings are offset by the distance between the cone tip and the mid-height of the sleeve. Friction sleeve readings must therefore be shifted upward by a distance of 0.3 feet (8 cm) in order to synchronize the tip and sleeve readings before the friction ratio (or any parameters) can be determined.

For this reason, the depth of usable data is not the depth to the tip of the cone, but the depth achieved by the mid-height of the sleeve. This maximum distance is reported at the end of the tabular printout and will always be about 0.3 feet (8 cm) less than the maximum depths reported on the standard plots.

01350





Zone SPT		Soil Behavior Type			
Number	q <sub>c</sub> /N	Printout Name	Plot Name		
1	2	Sensitive fine grained	Sens, fines		
2	1	Organic material	Organic		
3	1	· Clay	Clay		
4	1.5	Silty day to day	Silty clay		
5	2	Clayey silt to silty clay	Clayey silt		
6	2.5	Sandy silt to clayey silt	Silt		
7	3	Silty sand to sandy silt	Sandy silt		
8	4	. Sand to silty sand	Silty sand		
9	5	Sand	Sand		
10	6	Gravelly sand to sand	Gray, sand		
11	1.6+	Very stiff fine grained*	Stiff fines*		
12	2	Sand to diayey sand*	Clayey sand*		
13+	1	Plastic day	Plastic day		
14+	5	Cobble	Cobble		
15 <sup>+</sup>	6	Boulder	Boulder		
16 <sup>+</sup>	-	Void	Void		
17+	_	- No data -	No data		
18 +	-	- No soil correlation -	No correl		

over consolidated or cemented

KR059B027294

#### Notes:

- 1) Original soil chart is from Robertson & Campanella (1983).
- 2) STS extensions to the R & C chart are based on extensive local experience with Midwestern soils.
- 3) Zone 17 "- No data --" extends for all TIP values of -2 ksc and below.
- 4) All other areas not shown on the soil chart are Zone 18 \*- No soil correlation -\*.
- 5) Cone sensor limit corresponds to a maximum tip load of 500 ksc and a maximum triction load of 5 ksc.

<sup>+</sup> STS extension



### Corrected Equivalent SPT N<sub>1</sub> Value

SPT N values which are adjusted to an effective vertical overburden pressure of 1 ton per square foot are known as corrected SPT  $N_1$  values. These values are computed from the simple formula:

$$N_1 = N * C_n$$

Where:

N = uncorrected SPT N value described previously  $C_n = correction factor$ 

The correction factor  $C_n$  is determined from the graph shown in Figure 3. No attempt is made to differentiate between different soil types or different relative densities when using this graph.  $C_n$  is determined using an average line, mid-way between the 40-60 and 60-80 relative density lines.

For overburden pressures greater than 10 ksf (5 tsf), a constant  $C_n = 0.42$  is used. For overburden pressures less than 0.7 ksf (0.35 tsf) a constant correction factor of  $C_n = 1.8$  is used.

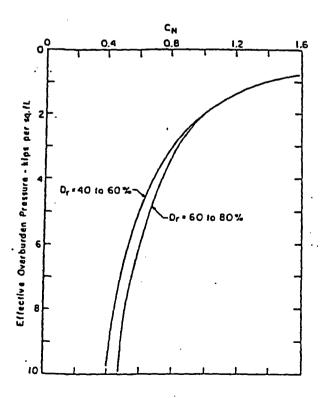


Figure 3 Values of C<sub>n</sub> Based on Studies on Fine Sands by Marcuson and Bieganousky (1977).

### Relative Density

The relative density D<sub>T</sub> of sands, silty sands and sandy silts is estimated from CPT data using the graph shown in Figure 5. This graph is based on chamber tests on normally consolidated, uncemented and unaged, moderately incompressible quartz sands.

Values of relative density are interpolated for points falling between the lines. Points to the left of the 40% line are reported as "<40": Points to the right of the 90% line are reported as ">90". The relative density is determined from the tip resistance and the effective vertical overburden pressure for an assumed value of  $K_0 = 0.45$ .

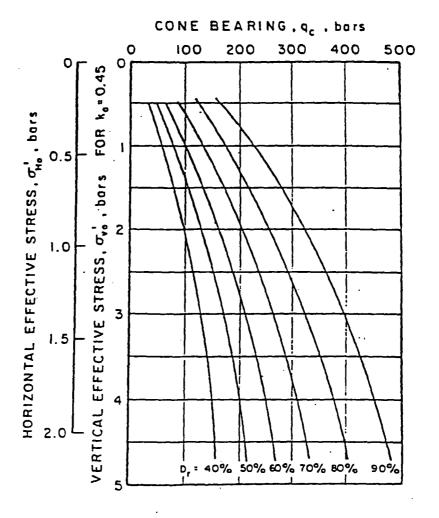


Figure 5 Relative Density Relationship for Uncemented and Unaged Quartz Sands. (Adapted from Baldi et al, 1982)



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Marcuson, W.F. III, and Bieganousky, W.S., 1977, "Laboratory Standard Penetration Tests on Fine Sands," Journal of Geotechnical Engineering Division, ASCE, Vol. 103, No. GT6, June, pp. 565-588.

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### APPENDIX G

MDEQ LABORATORY SOIL/ASH ANALYTICAL DATA



#### MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY ENVIRONMENTAL LABORATORY (517) 335-9800

P.O. Box 30270 Lansing, MI 48909

Report To: Environmental Response Div.

District #12

1342 SR-89 W. Ste B

Plainwell, MI 49080-1915

Attn: CAROL WEAVER

Total:

\$2,911.05

Lab Work Order # 0002128

Work Site ID: **CONSUMERS POWER** 

Sediment\Soil Matrix:

Received: 2/22/2000

Client:

Reported: 4/5/2000

ER PLAINWELL Number of Samples: 3

TEST	CP-MW-2 4-6	CP-MW-2 14-	CP-MW-2 20-	
UNITS	FT.	16 FT.	22 FT.	
Arsenic in Sediment	22	47	8.1	<del></del>
mg/kg (dry)			; ;	
Barium in Sediment	907	275	78	
mg/kg (dry)				
Cadmium in Sediment	K 2	K 2	K 2	
mg/kg (dry)		) }		
Chromium in Sediment	17	17	9	
mg/kg (dry)	!	<u>.                                    </u>		
Copper in Sediment	37	45	18	
mg/kg (dry)	<u> </u>			
Lead in Sediment	32	19	27	
mg/kg (dry)	<u>.</u>	·	;	
Mercury in Sediment	.21	.37	.15	
mg/kg (dry)			<u> </u>	
Selenium in Sediment	2.3	12	1.3	
mg/kg (dry)	, ,			_
Silver in Sediment	K 0.25	K 0.25	K 0.25	
mg/kg (dry)		! !		
Solids - Total - Inorganic	82.5	65.9	91.4	
· %TS				
Zinc in Sediment	37	34	81	
mg/kg (dry)			•	

This is an original report:

Lan C Uton To

Date: 4/5/2000

### RECEIVED

APR 0 7 2000

KR059B027299

MALCOLM PIRNIE, INC. EAST LANSING, MI

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
127-18-4	Tetrachloroethene	ND		130	100
108-90-7	Chlorobenzene	ND		130	100
630-20-6	1,1,1,2-Tetrachloroethane	ND		260	100
100-41-4	Ethylbenzene	ND		130	100
108383,106423	m & p-Xylene	ND		260	100
75-25-2	Bromoform	ND		260	100
100-42-5	Styrene	ND		130	100
95-47-6	o-Xylene	ND		130	100
79-34-5	1,1,2,2-Tetrachloroethane	ND		260	100
96-18-4	1,2,3-Trichloropropane	ND		260	100
110-57-6	trans-1,4-Dichloro-2-butene	ND		260	100
98-82-8	lsopropylbenzene	ND		260	100
108-86-1	Bromobenzene	ND		260	100
103-65-1	n-Propylbenzene	ND		260	100
108-67-8	1,3,5-Trimethylbenzene	ND		260	100
98-06-6	tert-Butylbenzene	ND		640	100
95-63-6	1,2,4-Trimethylbenzene	ND		260	100
135-98-8	sec-Butylbenzene	ND		640	100
541-73-1	1,3-Dichlorobenzene	ND		260	100
106-46-7	1,4-Dichlorobenzene	ND		260	100
99-87-6	p-lsopropyl toluene	ND	_	640	100
95-50-1	1,2-Dichlorobenzene	ND		260	100
104-51-8	n-Butylbenzene	ND		640	100
67-72-1	Hexachloroethane	ND		260	100
96-12-8	1,2-Dibromo-3-chloropropane	ND		640	100
120-82-1	1,2,4-Trichlorobenzene	ND		640	100
91-20-3	Naphthalene	ND		640	100
87-61-6	1,2,3-Trichlorobenzene	ND		640	100
91-57-6	2-Methylnaphthalene	ND		. 640	100

ND = not detected at the specified reporting limit. NM = not measured.

Reference method is 8260.

USEPA Methods 8260 and 624 are used to quantitate volatile organic compounds that have boiling points below 200°C.

2-Methylnaphthalene and naphthalene are compounds with boiling points above 200°C and are better suited to quantitation by USEPA Methods 8270 or 625 as semivolatile organic compounds.

J code results and reporting limits. Additional methanol added in the laboratory due to matrix type. Ash type sample absorbed initial amount of methanol, sample appeared dry.

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
121-14-2	2,4-Dinitrotoluene	ND		1100	2
86-73-7	Fluorene	ND		320	2
84-66-2	Diethyl phthalate	ND		320	2
100-01-6	4-Nitroaniline	ND		5400	2
534-52-1	2-Methyl-4,6-dinitrophenol	ND		5400	2
7005-72-3	4-Chlorophenyl phenylether	ND		320	2
156-10-5	N-Nitrosodiphenylamine	ND		640	2
103-33-3	Azobenzene	ND	······································	640	2
101-55-3	4-Bromophenyl phenylether	ND		640	2
118-74-1	Hexachlorobenzene	ND		640	2
87-86-5	Pentachlorophenol	ND .		11000	2
85-01-8	Phenanthrene	ND		320	2
120-12-7	Anthracene	ND		320	2
86-74-8	Carbazole	ND		1100	2
84-74-2	Di-n-butyl phthalate	ND		320	2
206-44-0	Fluoranthene	ND		320	2
129-00-0	Ругепе	ND		3200	25
85-68-7	Butyl benzyl phthalate	ND		3200	25
56-55-3	Benz(a)anthracene	ND ,		3200	25
218-01-9	Chrysene	ND		3200	25
117-81-7	Bis(2-ethylhexyl)phthalate	ND		6400	25
117-84-0	Di-n-octyl phthalate	ND		6400	25
205-99-2	Benzo(b)fluoranthene	ND		6400	25
207-08-9	Benzo(k)fluoranthene	ND		6400	25
50-32-8	Benzo(a)pyrene	ND		6400	25
193-39-5	Indeno(1,2,3-cd)pyrene	ND		6400:	25
53-70-3	Dibenz(a,h)anthracene	ND		6400	25
191-24-2	Benzo(g,h,i)perylene	ND ;		6400	25

ND = not detected at the specified reporting limit.

NM = not measured.

Reference method is 8270.

REPORTING LIMITS ELEVATED BECAUSE ONLY 10G OF SAMPLE WAS ABLE TO BE EXTRACTED. THE DILUTION FACTOR IS 2.5 EXCEPT WHERE 25 IS LISTED. ALL REPORTING LIMITS ARE CORRECTLY CALCULATED.

ND = not detected at the specified reporting limit. NM = not measured. Reference method for pesticides is 8081. Reference method for PCBs is 8082.

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING :	DILUTION FACTOR
127-18-4	Tetrachloroethene	ND		79	52.3
108-90-7	Chlorobenzene	ND		79	52.3
630-20-6	1,1,1,2-Tetrachloroethane	ND		. 160	52.3
100-41-4	Ethylbenzene	ND		79	52.3
108383,106423	m & p-Xylene	ND		160	52.3
75-25-2	Bromoform	ND		160	52.3
100-42-5	Styrene	ND		79	52.3
95-47-6	o-Xylene	· ND		79	52.3
79-34-5	1,1,2,2-Tetrachloroethane	ND		160;	52.3
96-18-4	1,2,3-Trichloropropane	ND		160	52.3
110-57-6	trans-1,4-Dichloro-2-butene	ND		160	52.3
98-82-8	Isopropylbenzene	ND		160	52.3
108-86-1	Bromobenzene	ND		160	52.3
103-65-1	n-Propylbenzene	ND	· · · · · · · · · · · · · · · · · · ·	160	52.3
108-67-8	1,3,5-Trimethylbenzene	ND		160	52.3
98-06-6	tert-Butylbenzene	ND		400	52.3
95-63-6	1,2,4-Trimethylbenzene	ND		160	52.3
135-98-8	sec-Butylbenzene	ND		400	52.3
541-73-1	1,3-Dichlorobenzene	ND		160	52.3
106-46-7	1,4-Dichlorobenzene	ND		160	52.3
99-87-6	p-lsopropyl toluene	ND		400	52.3
95-50-1	1,2-Dichlorobenzene	ND		160	52.3
104-51-8	n-Butylbenzene	ND		400	52.3
67-72-1	Hexachloroethane	ND		160	52.3
96-12-8	1,2-Dibromo-3-chloropropane	ND		400;	52.3
120-82-1	1,2,4-Trichlorobenzene	ND		400	52.3
91-20-3	Naphthalene	ND		400	52.3
87-61-6	1,2,3-Trichlorobenzene	ND		400	52.3
91-57-6	2-Methylnaphthalene	ND		400	52.3

ND = not detected at the specified reporting limit. NM = not measured. Reference method is 8260.

USEPA Methods 8260 and 624 are used to quantitate volatile organic compounds that have boiling points below 200°C.

<sup>2-</sup>Methylnaphthalene and naphthalene are compounds with boiling points above 200°C and are better suited to quantitation by USEPA Methods 8270 or 625 as semivolatile organic compounds.

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
121-14-2	2,4-Dinitrotoluene	ND .		500	
86-73-7	Fluorene	ND		150	
84-66-2	Diethyl phthalate	ND		150	
100-01-6	4-Nitroaniline	ND ;		2600	
534-52-1	2-Methyl-4,6-dinitrophenol	ND		2600	
7005-72-3	4-Chlorophenyl phenylether	ND		150	
156-10-5	N-Nitrosodiphenylamine	ND		300	
103-33-3	Azobenzene	ND		300	<del></del>
101-55-3	4-Bromophenyl phenylether	ND		300	<u></u>
118-74-1	Hexachlorobenzene	ND		300	<del></del>
87-86-5	Pentachlorophenol	ND		5200	<del>-</del>
85-01-8	Phenanthrene	170		150	
120-12-7	Anthracene	ND		150	
86-74-8	Carbazole	ND		500	
84-74-2	Di-n-butyl phthalate	ND		150	
206-44-0	Fluoranthene	ND		150	
129-00-0	Pyrene	ND		150	
85-68-7	Butyl benzyl phthalate	ND		150	
56-55-3	Benz(a)anthracene	ND		150	
218-01-9	Chrysene	ND :		150	
117-81-7	Bis(2-ethylhexyl)phthalate	850		300	
117-84-0	Di-n-octyl phthalate	ND		300	-
205-99-2	Benzo(b)fluoranthene	ND	`	300	
207-08-9	Benzo(k)fluoranthene	ND		300	
50-32-8	Benzo(a)pyrene	ND	· · · · · · · · · · · · · · · · · · ·	300	
193-39-5	Indeno(1,2,3-cd)pyrene	ND		300	
53-70-3	Dibenz(a,h)anthracene	ND		300	
191-24-2	Benzo(g,h,i)perylene	ND		300	

ND = not detected at the specified reporting limit.

NM = not measured.

Reference method is 8270.

ND = not detected at the specified reporting limit.

NM = not measured.

Reference method for pesticides is 8081.

Reference method for PCBs is 8082.

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
127-18-4	Tetrachloroethene	ND		53	48.1
108-90-7	Chlorobenzene	ND		53	48.1
630-20-6	1,1,1,2-Tetrachloroethane	ND		110	48.1
100-41-4	Ethylbenzene	ND		53	48.1
108383,106423	m & p-Xylene	ND		110	48.1
75-25-2	Bromoform	ND		110	48.1
100-42-5	Styrene	ND		53	48.1
95-47-6	o-Xylene	ND		. 53	48.1
79-34-5	[1,1,2,2-Tetrachloroethane	ND		110	48.1
96-18-4	1,2,3-Trichloropropane	ND		110	48.1
110-57-6	trans-1,4-Dichloro-2-butene	ND		110	48.
98-82-8	lsopropylbenzene	ND		110	48.1
108-86-1	Bromobenzene	ND		110	48.1
103-65-1	n-Propylbenzene	ND		110	48.1
108-67-8	1,3,5-Trimethylbenzene	ND		110	48.1
98-06-6	tert-Butylbenzene	ND		260	48.1
95-63-6	1,2,4-Trimethylbenzene	ND		110	48.1
135-98-8	sec-Butylbenzene	ND		260	48.1
541-73-1	1,3-Dichlorobenzene	ND		110	48.1
106-46-7	1,4-Dichlorobenzene	ND		110:	48.1
99-87-6	p-lsopropyl toluene	ND		260	48.1
95-50-1	1,2-Dichlorobenzene	ND		110	48.1
104-51-8	n-Butylbenzene	ND		260	48.1
67-72-1	Hexachloroethane	ND		110	48.1
96-12-8	1,2-Dibromo-3-chloropropane	ND		260	48.1
120-82-1	1,2,4-Trichlorobenzene	ND		260	48.1
91-20-3	Naphthalene	ND		260	48.1
87-61-6	1,2,3-Trichlorobenzene	ND		260	48.1
91-57-6	2-Methylnaphthalene	ND		260	48.1

ND = not detected at the specified reporting limit. NM = not measured. Reference method is 8260.

USEPA Methods 8260 and 624 are used to quantitate volatile organic compounds that have boiling points below 200°C.

<sup>2-</sup>Methylnaphthalene and naphthalene are compounds with boiling points above 200°C and are better suited to quantitation by USEPA Methods 8270 or 625 as semivolatile organic compounds.

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
121-14-2	2,4-Dinitrotoluene	ND		360	
86-73-7	Fluorene	ND		110	
84-66-2	Diethyl phthalate	ND		110	
100-01-6	4-Nitroaniline	ND		1900	
534-52-1	2-Methyl-4,6-dinitrophenol	. ND		1900	
7005-72-3	4-Chlorophenyl phenylether	ND		110	1
156-10-5	N-Nitrosodiphenylamine	ND		220	1
103-33-3	Azobenzene	ND		220	
101-55-3	4-Bromophenyl phenylether	ND		220	1
118-74-1	Hexachlorobenzene	ND		220	
87-86-5	Pentachlorophenol	ND		3700	1
85-01-8	Phenanthrene	67	T	110	]
120-12-7	Anthracene	ND		110	]
86-74-8	Carbazole	ND		360	
84-74-2	Di-n-butyl phthalate	, ND		110	]
206-44-0	Fluoranthene	120		110	1
129-00-0	Pyrene	110		110	]
85-68-7	Butyl benzyl phthalate	ND	_	110	1
56-55-3	Benz(a)anthracene	ND		110	]
218-01-9	Chrysene	84	T	110	
117-81-7	Bis(2-ethylhexyl)phthalate	ND		220	]
117-84-0	Di-n-octyl phthalate	ND		220	1
205-99-2	Benzo(b)fluoranthene	ND		220	1
207-08-9	Benzo(k)fluoranthene	ND		220	1
50-32-8	Benzo(a)pyrene	ND		220	1
193-39-5	Indeno(1,2,3-cd)pyrene	ND		220	1
53-70-3	Dibenz(a,h)anthracene	ND		220	1
191-24-2	Benzo(g,h,i)perylene	ND		220	1

ND = not detected at the specified reporting limit.

NM = not measured.

Reference method is 8270.

ND = not detected at the specified reporting limit.

 $\sqrt{M} = not measured.$ 

Reference method for pesticides is 8081.
Reference method for PCBs is 8082.



# MICHIGAN DEPT. OF ENVIRONMENTAL QUALITY ENVIRONMENTAL LABORATORY ANALYSIS REQUEST SHEET

LAB ORDE	R# 0002128 #			MATRIX=SED	IMENT/SOIL/S	
SUBMITTE!	R DISTRICT OR OFFICE	MDEQ PRO MANAGER	A PHONE			HT CODES?
ERD	Plainnell 5	Caroll	weaver	616-692-2673	<del></del>	
LOCATION	SAMPLED / SITE ID NUMBER		INDEX	PCA	PROJECT	PH
Cons	umers Power 14439	0427	47917	36744	454678	~- · · · · · · · · · · · · · · · · · · ·
COLLECTE		PHONE		ADDITIONAL REPORT	14 4	·
Hans	Schannes	5171324	-5047	TO ATTENTION OF	Ken Davie	
OVERFLOY	W CONTRACT LAB (Required for ERD)				(If different than abo	
				1500	blocty, Ste 2	216
	**** SAFETY INFORMATION	=	***			
	SEE BACK OF		COLLECTED			
LAB USE ONLY	SAMPLE IDENTIFICATION	DATE	TIME	C	COMMENTS	
TO SE	Cf-mw-2-4-6'	7-19-00	1345			
2 5 5	CP-MW-Z-14-16'		1430			
The state of the s	CP-MW-Z-20-ZZ'		1505			
3	CP-WW Z-C-CZ		1			
		<del></del>	<del> </del>			
5				<u> </u>		
6				<del> </del>	<del></del>	
777			ļ	ļ		
8						
9			<u> </u>			
10						
ALTU-COMPANY	ORGANIC	GENERAL CH	EMISTRY		INORGANIC	
	VOLATILES	GS		MS		
Full List	(McOH/8260) CDZ 3 4 5 6 7 8 9 10	COD	1 2 3 4 5 6 7		METALS OF THE	
BTEXMT	BE only 1 2 3 4 5 6 7 8 9 10	KJEL N, Tot. P Phenolica	1234567		Cr, Cu Pb, Hg, Se, Ag, In 1234	Zn) 5 5 6 7 8 9 10
OS	PESTICIDES/PCBS	Total CN	1234567	8 9 🏗 💢 Be Mo 1	ti V 1234	5 6 7 8 9 10
Pesticides (	(8081/8082) & PCBs		1 2 3 4 5 6 7 1 2 3 4 5 6 7	8 9 10 N- Nickel	1 2 3 4	1 5 6 7 8 9 10 1 5 6 7 8 9 10
Pesticides (	only 1 2 3 4 5 6 7 8 9 10		1 2 3 4 5 6 7	8 9 10 Ti - Thailium Ca Mg Na 1		5 6 7 8 9 10
PCBs only				•	_	5678910
BNA	BASE NEUTRAL & ACIDS (8270)	•		% Total Sol	1234	5 6 7 8 9 10
BNA	#225945678910 12345678910	•				\$ 5 6 7 <del>8</del> 9 10 \$ 5 6 7 <b>8</b> 9 10
PNAs only BNs only						
	SPECIAL REQUESTS					
Library Sea	irch (Qualitative)					
Volatiles Semivolat						
Other	1 2 3 4 5 6 7 8 9 10					
			<del></del>		<del></del>	<del></del>
٠ .	BOTTLE / TESTS RELEASED BY / AFF	ILIATION	RECEIV	ED BY / AFFILIATION		TE & TIME
Chain-of- Custody	dand		01	105ET	3 200	
Cus	1) 00000		1110			
и !	2)	<b>\</b>	•	_		



### MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY ENVIRONMENTAL LABORATORY (517) 335-9800

P.O. Box 30270 Lansing, MI 48909

Environmental Response Div. Report To:

District #12

1342 SR-89 W. Ste B

Plainwell, MI 49080-1915

CAROL WEAVER Attn:

Total:

\$2,330.42

Lab Work Order# 0002127

Work Site ID:

CONSUMERS POWER/

Matrix: Sediment\Soil

Received: 2/18/2000

Reported: 4/5/2000

Client: ER\_PLAINWELL Number of Samples: 3

CP-MW-1 4-6	CP-MW-1 14-	CP-MW-1 24-	
FT.	16 FT.	26 FT.	
24	39	4.0	<del></del>
205	365	25	
K 2	K 2	K 2	<del></del>
21	22	5	
54.5	57	3	
!		· !	
8.5	27	K 5	<del></del>
1.1	1.3	K .05	
		;	•
3.6	9.8	1.7	
		•	
K 0.25	K 0.25	K 0.25	
		<u> </u>	
84.5	72.8	72.8	
<u> </u>			
28	43	17	
	FT. 24  205  K 2  21  54.5  8.5  1.1  3.6  K 0.25	FT. 16 FT.  24 39  205 365  K 2 K 2  21 22  54.5 57  8.5 27  1.1 1.3  3.6 9.8  K 0.25 K 0.25	24       39       4.0         205       365       25         K 2       K 2       K 2         21       22       5         54.5       57       3         8.5       27       K 5         1.1       1.3       K .05         3.6       9.8       1.7         K 0.25       K 0.25       K 0.25         84.5       72.8       72.8

COPY TO KENNETH DAVIS- MPE

This is an original report:

Date: 4/5/2006

MALCOLM PIRNIE, INC. EAST LANSING, MI

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
127-18-4	Tetrachloroethene	150	J	64	52.9
108-90-7	Chlorobenzene	ND		64	52.9
630-20-6	1,1,1,2-Tetrachloroethane	ND		130	52.9
100-41-4	Ethylbenzene	ND :		64	52.9
108383,106423	m & p-Xylene	ND		130	52.9
75-25-2	Bromoform	ND		130	52.9
100-42-5	Styrene	ND		64	52.9
95-47-6	o-Xylene	ND		64;	52.9
79-34-5	1,1,2,2-Tetrachloroethane	ND		130	52.9
96-18-4	1,2,3-Trichloropropane	ND		130	52.9
110-57-6	itrans-1,4-Dichloro-2-butene	ND		130	52.9
98-82-8	Isopropylbenzene	ND		130	52.9
108-86-1	Bromobenzene	ND		130	52.9
103-65-1	n-Propylbenzene	ND		130	52.9
108-67-8	1,3,5-Trimethylbenzene	ND		130	52.9
98-06-6	tert-Butylbenzene	ND		320	52.9
95-63-6	1,2,4-Trimethylbenzene	ND		130	52.9
135-98-8	sec-Butylbenzene	ND		. 320	52.9
541-73-1	1,3-Dichlorobenzene	ND		130	52.9
106-46-7	1,4-Dichlorobenzene	ND		130	52.9
99-87-6	p-Isopropyl toluene	ND		320	52.9
95-50-1	1,2-Dichlorobenzene	ND		130	52.9
104-51-8	n-Butylbenzene	ND		320	52.9
67-72-1	Hexachloroethane	ND		130	52.9
96-12-8	1,2-Dibromo-3-chloropropane	ND		320	52.9
120-82-1	1,2,4-Trichlorobenzene	ND		320	52.9
91-20-3	Naphthalene	ND ;		320	52.9
87-61-6	1,2,3-Trichlorobenzene	ND		320	52.9
91-57-6	2-Methylnaphthalene	ND		320	52.9

ND = not detected at the specified reporting limit. NM = not measured. Reference method is 8260.

USEPA Methods 8260 and 624 are used to quantitate volatile organic compounds that have boiling points below 200°C.

<sup>2-</sup>Methylnaphthalene and naphthalene are compounds with boiling points above 200°C and are better suited to quantitation by USEPA Methods 8270 or 625 as semivolatile organic compounds.

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
121-14-2	2,4-Dinitrotoluene	ND		990	2
86-73-7	Fluorene	ND		300	2
84-66-2	Diethyl phthalate	ND		300	7
100-01-6	4-Nitroaniline	ND		5100	
534-52-1	2-Methyl-4,6-dinitrophenol	ND		5100	
7005-72-3	4-Chlorophenyl phenylether	ND		300	2
156-10-5	N-Nitrosodiphenylamine	ND		600	2
103-33-3	Azobenzene	ND		600	2
101-55-3	4-Bromophenyl phenylether	ND		600	2
118-74-1	Hexachlorobenzene	ND		600	2
87-86-5	Pentachlorophenol	ND		10000	2
85-01-8	Phenanthrene	ND		300	
120-12-7	Anthracene	ND		300	2
86-74-8	Carbazole	ND		990	
84-74-2	Di-n-butyl phthalate	ND		300	
206-44-0	Fluoranthene	ND		300	
129-00-0	Pyrene	ND		300	
85-68-7	Butyl benzyl phthalate	ND		300	
56-55-3	Benz(a)anthracene	ND		300	
218-01-9	Chrysene	ND		300	2
117-81-7	Bis(2-ethylhexyl)phthalate	ND		600	2
117-84-0	Di-n-octyl phthalate	ND		600	
205-99-2	Benzo(b)fluoranthene	ND		600	2
207-08-9	Benzo(k)fluoranthene	ND		600	2
50-32-8	Benzo(a)pyrene	ND		600	2
193-39-5	Indeno(1,2,3-cd)pyrene	ND		<b>600</b> i	
53-70-3	Dibenz(a,h)anthracene	ND		600	2
191-24-2	Benzo(g,h,i)perylene	ND	<del></del>	600	

ND = not detected at the specified reporting limit.

NM = not measured.

Reference method is 8270.

The reporting limits are elevated because only 10 grams of sample was able to be extracted. The dilution factor on this report is actually 2.5 and reporting limits are correctly reported.

ND = not detected at the specified reporting limit.

NM = not measured.

Reference method for pesticides is 8081.

Reference method for PCBs is 8082.

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING :	DILUTION FACTOR
127-18-4	Tetrachloroethene	ND		81	54.3
108-90-7	Chlorobenzene	ND		81	54.3
630-20-6	1,1,1,2-Tetrachloroethane	ND		160	54.3
100-41-4	Ethylbenzene	ND		81	54.3
108383,106423	m & p-Xylene	ND		160	54.3
75-25-2	Bromoform	ND		160	54.3
100-42-5	Styrene	ND		81	54.3
95-47-6	o-Xylene	ND		81	54.3
79-34-5	1,1,2,2-Tetrachloroethane	ND		160	54.3
96-18-4	1,2,3-Trichloropropane	ND		160	54.3
110-57-6	trans-1,4-Dichloro-2-butene	ND		160	54.3
98-82-8	lsopropylbenzene	ND		160	54.3
108-86-1	Bromobenzene	ND	:	160	54.3
103-65-1	n-Propylbenzene	ND	. 1	160	54.3
108-67-8	1,3,5-Trimethylbenzene	ND	:	160	54.3
98-06-6	tert-Butylbenzene	ND		410	54.3
95-63-6	1,2,4-Trimethylbenzene	ND		160	54.3
135-98-8	sec-Butylbenzene	ND	;	410	54.3
541-73-1	1,3-Dichlorobenzene	ND		160 <sup>i</sup>	54.3
106-46-7	1,4-Dichlorobenzene			160	54.3
99-87-6	p-lsopropyl toluene	ND		410	54.3
95-50-1	1,2-Dichlorobenzene	ND	[	160	54.3
104-51-8	n-Butylbenzene	ND	;	410	54.3
67-72-1	Hexachloroethane	ND		160	54.3
96-12-8	1,2-Dibromo-3-chloropropane	ND		410	54.3
120-82-1	1,2,4-Trichlorobenzene	ND	·	410	54.3
91-20-3	Naphthalene	ND		410	54.3
87-61-6	1,2,3-Trichlorobenzene	ND		410	54.3
91-57-6	2-Methylnaphthalene	ND		410	54.3

ND = not detected at the specified reporting limit. NM = not measured. Reference method is 8260.

USEPA Methods 8260 and 624 are used to quantitate volatile organic compounds that have boiling points below 200°C. 2-Methylnaphthalene and naphthalene are compounds with boiling points above 200°C and are better suited to quantitation by USEPA Methods 8270 or 625 as semivolatile organic compounds.

. CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
121-14-2	2,4-Dinitrotoluene	ND		490	
86-73-7	Fluorene	ND		150	· · · · · · · · · · · · · · · · · · ·
84-66-2	Diethyl phthalate	ND		150	
100-01-6	4-Nitroaniline	ND		2500	
534-52-1	2-Methyl-4,6-dinitrophenol	ND		2500	
7005-72-3	4-Chlorophenyl phenylether	ND		150	
156-10-5	N-Nitrosodiphenylamine	ND		300	
103-33-3	Azobenzene	ND		300	
101-55-3	4-Bromophenyl phenylether	ND		300	
118-74-1	Hexachlorobenzene	ND		300	
87-86-5	Pentachlorophenol	ND		5100	
85-01-8	Phenanthrene	ND		150	
120-12-7	Anthracene	ND		150	
86-74-8	Carbazole	ND		490	
84-74-2	Di-n-butyl phthalate	ND		150	
206-44-0	Fluoranthene	ND		150	
129-00-0	Pyrene	ND		150	
85-68-7	Butyl benzyl phthalate	ND		150	
56-55-3	Benz(a)anthracene	ND		150	
218-01-9	Chrysene	ND		150	
117-81-7	Bis(2-ethylhexyl)phthalate	ND		300	
117-84-0	Di-n-octyl phthalate	ND		300	
205-99-2	Benzo(b)fluoranthene	ND		300	
207-08-9	Benzo(k)fluoranthene	ND		300	
50-32-8	Benzo(a)pyrene	ND		300	
193-39-5	Indeno(1,2,3-cd)pyrene	ND		300	
53-70-3	Dibenz(a,h)anthracene	ND		300	
191-24-2	Benzo(g,h,i)perylene	ND		300	

ND = not detected at the specified reporting limit.

NM = not measured.

Reference method is 8270.

CODE ALL RESULTS AND REPORTING LIMITS "J" DUE TO POOR SURROGATE RECOVERIES.

ND = not detected at the specified reporting limit.

NM = not measured.

Reference method for pesticides is 8081.

Reference method for PCBs is 8082.

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
127-18-4	Tetrachloroethene	ND		75	49.3
108-90-7	Chlorobenzene	ND		75	49.3
630-20-6	1,1,1,2-Tetrachloroethane	ND		150	49.3
100-41-4	Ethylbenzene	ND		75	49.:
108383,106423	m & p-Xylene	ND		150	49.3
75-25-2	Bromoform	ND		150	49.3
100-42-5	Styrene	ND		75	49.3
95-47-6	o-Xylene	ND		75	49.3
79-34-5	1,1,2,2-Tetrachloroethane	ND	<del></del>	150	49.3
96-18-4	1,2,3-Trichloropropane	ND		150	49.3
110-57-6	trans-1,4-Dichloro-2-butene	ND	<u> </u>	150	49.:
98-82-8	Isopropylbenzene	ND	:	150	49.:
108-86-1	Bromobenzene	ND	1	150	49.3
103-65-1	n-Propylbenzene	ND	:	150	49.3
108-67-8	1,3,5-Trimethylbenzene	ND	!	150	49.3
98-06-6	tert-Butylbenzene	ND	1	370	49.:
95-63-6	1,2,4-Trimethylbenzene	ND		150	49.
135-98-8	sec-Butylbenzene	ND		370	. 49.
541-73-1	1,3-Dichlorobenzene	ND	!	150	49.3
106-46-7	1,4-Dichlorobenzene	ND	:	150	49.:
99-87-6	p-Isopropyl toluene	ND	:	370	49.3
95-50-1	1,2-Dichlorobenzene	ND	i	150	49.3
104-51-8	n-Butylbenzene	ND	:	370	49.3
67-72-1	Hexachloroethane	ND	1	· 150	49.3
96-12-8	1,2-Dibromo-3-chloropropane	ND	!	370	49.3
120-82-1	1,2,4-Trichlorobenzene	ND	!	370	49.3
91-20-3	Naphthalene	ND		370	49.3
87-61-6	1,2,3-Trichlorobenzene	ND	!	370	49.3
91-57-6	2-Methylnaphthalene	ND	!	370	49.3

ND = not detected at the specified reporting limit. NM = not measured. Reference method is 8260.

USEPA Methods 8260 and 624 are used to quantitate volatile organic compounds that have boiling points below 200°C. 2-Methylnaphthalene and naphthalene are compounds with boiling points above 200°C and are better suited to quantitation by USEPA Methods 8270 or 625 as semivolatile organic compounds.

DE

#### MICHIGAN DEPT. OF ENVIRONMENTAL QUALITY **ENVIRONMENTAL LABORATORY**

ANALYSIS REQUEST SHEET

LAB ORDER # 60 02 -/2/		<u> </u>	MATRIX=SEDIMENT	r/soil/solids
SUBMITTER DISTRICT DIVISION OR OFFICE	MDEQ PROJ MANAGER &	ECT PHONE		ACCEPT HT CODES?
ERD Plainwell	_		616-692-2675	<del>-</del>
LOCATION SAMPLED / SITE ID NUMBER		INDEX	PCA PROJE	СТ РН
Consumers Power /390427		4791		1678
COLLECTED BY	PHONE		ADDITIONAL REPORT	eth Davis
Gordon Parish	(517) 324	-505E	_ · <del></del>	
OVERFLOW CONTRACT LAB (Required for ERD)	·			than above office)
**** SAFETY INFORMATION RE SEE BACK OF FORM	-	**	E. Lansin	J, MI 48823
LAB USE SAMPLE IDENTIFICATION ONLY	SAMPLE CO	OLLECTED TIME	COMMEN	TS
ONLY CP-MW-1-4-6'	2-18-00		OS 4 BNA in	Same i.c
( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	1	1:	1	, 32.00
2 CP - MW-1 - 24-26'	+	12 -		
District (March 1996)	1	<del>                                     </del>		•
	+	1	:	
* S-44	+	1		
	+	<del> </del>		
**************************************	+	<u> </u>	i	
10000000000000000000000000000000000000	+	<del> </del>		. 2
	+		-	•
Red Oncorre			<u> </u>	_
ORGANIC GE VOA VOLATILES GS	NERAL CHE	MISTRY	MS INO	RGANIC
(MeOH/8260) Full List (1204 4 5 6 7 8 9 10 COD	1	23455	# 9 10 MICH TEN METALS	5 <b>₫</b> Q <b>③</b> 45678910
BTEX/MTBE only 1 2 3 4 5 6 7 8 9 10 KJELN		234557	8 9 10 (As, Bs, Cd, Cr, Cu, Pb, I 9 10 Fe Co Li Mn	Hg Se Ag Zn) 1 2 3 4 5 6 7 8 9 10
OS PESTICIDES/PCBS Total C	CN 1	234==	ã → 10 Al Be Mo Ti V	1 2 3 4 5 6 7 8 9 10
(8081/8082) Pesticides & PCBs (DD) 3 4 5 6 7 8 9 10	1		3 9 10 Ni - Nicket	1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10
Pesticides only 1 2 3 4 5 6 7 8 9 10 PCBs only 1 2 3 4 5 6 7 8 9 10			3 9 10 TI-Thallium Ca Mg Na K	1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10
BNA BASE NEUTRAL & ACIDS			% Total Solids	1 2 3 4 5 6 7 8 9 10
(8270)	•			1 2 3 4 5 6 7 8 9 10
PNAs only 1 2 3 4 5 6 7 8 9 10				1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10
BNs only 1 2 3 4 5 6 7 8 9 10				
SPECIAL REQUESTS Library Search (Qualitative)				
Volatiles 1 2 3 4 5 6 7 8 9 10 Semivolatiles 1 2 3 4 5 6 7 8 9 10			KI	R059B027318
Other 1 2 3 4 5 6 7 8 9 10				
	<del></del>	<del></del>		
BOTTLE / TESTS RELEASED BY / AFFILIATION	1	RECEIV	ED BY / AFFILIATION	DATE & TIME
Ochain O De Les Klein O L	IPE	Car	· Marta.	2-16-00
53				



#### MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY ENVIRONMENTAL LABORATORY (517) 335-9800

P.O. Box 30270 Lansing, MI 48909

Report To: Environmental Response Div.

District #12

1342 SR-89 W. Ste B

Plainwell, MI 49080-1915

Attn: CAROL WEAVER

UNITS

mg/kg (dry)

Total:

Arsenic in Sediment

TEST

\$7,976.62

Lab Work Order # 0002136

Work Site ID:

**CONSUMERS POWER** 

7250

Matrix: Sediment\Soil

Received: 2/23/2000

Reported: 4/5/2000

Client:

ER\_PLAINWELL

25

Number of Samples: 11

CP-MW-3-4-6ft CP-MW-3-14- CP-MW-3-26- CP-DB-1-4-6ft 16ft 28ft 31 20 21 33

580 410 2000 Barium in Sediment 348 mg/kg (dry) K 2 K 2 4.5 K 2 Cadmium in Sediment mg/kg (dry) Chromium in Sediment 20 20 108 27

mg/kg (dry) 39 39 1320 35 Copper in Sediment mg/kg (dry)

K 5 Lead in Sediment mg/kg (dry) .32 .19 Mercury in Sediment .23 .19 HT

K 5

mg/kg (dry) Selenium in Sediment 3.5 4.2 19 DM 4.3 DM

mg/kg (dry) K 0.25 K 0.25 4.6 K 0.25 Silver in Sediment

mg/kg (dry) Solids - Total - Inorganic 69.3 72.9 72.7 71.3 %TS

19 41 4700 19 Zinc in Sediment mg/kg (dry)

EST	CP-DB-1-14-	CP-DB-1-24-	
UNITS	16ft	26ft	
Arsenic in Sediment	20	1.3	RECEIVED
mg/kg (dry)	<u>.</u> .	•	'
Barium in Sediment	270	32	1.7 1003
mg/kg (dry)	•		- Alif
Cadmium in Sediment	K 2	K 2	71 M SING!
mg/kg (dry)	;		RECEIVED
Chromium in Sediment	20	5 .	
mg/kg (dry)		:	APR 0 7 2000
Copper in Sediment	45	4	MALCOL
mg/kg (dry)			MALCOLM PIRNIE, INC. EAST LANSING, MI

Work Order #: 0002136-01ME

Date Collected: 2/20/2000

Test Code:

SME

Test Name:

MEOH-Sed

Date Analyzed: 2/24/2000

2/24/2000 by L1

Sample ID:

CP-MW-3-4-6ft

Total Solids:

71%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
75-71-8	Dichlorodifluoromethane	ND		540	76.8
74-87-3	Chloromethane	ND		540	76.8
75-01-4	Vinyl chloride	ND		220	76.8
74-83-9	Bromomethane	ND		540	76.8
75-00-3	Chloroethane	ND		540	76.8
75-69-4	Trichlorofluoromethane	ND		540	76.8
67-64-1	Acetone	ND	· ·	1600	76.8
60-29-7	Diethyl ether	ND		540	76.8
75-35-4	1,1-Dichloroethylene	ND	·	110	76.8
74-88-4	Methyl iodide	ND		220	76.8
107-13-1	Acrylonitrile	ND		540	76.8
75-09-2	Methylene chloride	ND		540	76.8
75-15-0	Carbon disulfide	ND		540	76.8
156-60-5	trans-1,2-Dichloroethylene	ND		: 110	76.8
1634-04-4	Methyltertbutylether (MTBE)	ND		540	76.8
75-34-3	1,1-Dichloroethane	ND		110 <sub>i</sub>	76.8
78-93-3	2-Butanone (MEK)	ND		540	76.8
156-59-2	cis-1,2-Dichloroethylene	ND		110	76.8
67-66-3	Chloroform	ND		110	76.8
74-97-5	Bromochloromethane	. ND		220	76.8
71-55-6	1,1,1-Trichloroethane	ND .		110	76.8
107-06-2	1,2-Dichloroethane	ND		110	76.8
71-43-2	Benzene	ND		110	76.8
56-23-5	Carbon tetrachloride	ND		110	76.8
78-87-5	1,2-Dichloropropane	ND		110	76.8
79-01-6	Trichloroethylene	ND		110	76.8
74-95-3	Dibromomethane	ND		220	76.8
75-27-4	Bromodichloromethane	ND		220	76.8
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		540	76.8
10061-01-5	cis-1,3-Dichloropropene	ND		110	76.8
10061-02-6	trans-1,3-Dichloropropene	ND		110	76.8
108-88-3	Toluene	ND		110	76.8
79-00-5	1,1,2-Trichloroethane	ND	<del></del>	110	76.8
591-78-6	2-Hexanone	ND		540	76.8
124-48-1	Dibromochloromethane	ND		220	76.8
106-93-4	1,2-Dibromoethane	ND	<del></del>	110	76.8

Work Order #: 0002136-010S

Date Collected: 2/20/2000

Test Code:

Date Extracted: 2/25/2000

Test Name: by tm-1133

BNA - Sediment

**SBNA** 

Date Analyzed: 3/7/2000 Total Solids:

71%

by JRS

Sample ID: CP-MW-3-4-6ft

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION
62-75-9	N-Nitrosodimethylamine	ND	:	460	FACTOR
108-95-2	Phenol	ND		460	
111-44-4	Bis(2-chloroethyl)ether	ND		140	<del></del>
95-57-8	2-Chlorophenol	ND		460	<del></del>
541-73-1	1,3-Dichlorobenzene	ND		140	
106-46-7	1,4-Dichlorobenzene	ND		140	
95-50-1	1,2-Dichlorobenzene	ND		140	
95-48-7	2-Methylphenol (o-cresol)	ND		460	
108-60-1	Bis(2-chloroisopropyl)ether	ND		140	
108394,106445	3/4-Methylphenol (m/p-cresol)		·	930	
621-64-7	N-Nitrosodi-n-propylamine	ND	<del> </del>	280	
67-72-1	Hexachloroethane	ND		140	
98-95-3	Nitrobenzene	ND	<del> </del>	280	
78-59-1	lsophorone	ND	· · · · · · · · · · · · · · · · · · ·	140	
88-75-5	2-Nitrophenol	ND		460	
105-67-9	2,4-Dimethylphenol	ND		460	
111-91-1	Bis(2-chloroethoxy)methane	ND	<u> </u>	280	
120-83-2	2,4-Dichlorophenol	ND	<del></del>	460	
120-82-1	1,2,4-Trichlorobenzene	ND		280	<del></del>
91-20-3	Naphthalene	ND		140	
87-68-3	Hexachlorobutadiene	ND		280	<del></del>
59-50-7	4-Chloro-3-methylphenol	ND		460	<del></del>
91-57-6	2-Methylnaphthalene	ND		350	
77-47-4	Hexachlorocyclopentadiene	ND		2800	<del></del>
88-06-2	2,4,6-Trichlorophenol	ND		460	· <del></del>
95-95-4	2,4,5-Trichlorophenol	ND		460	····
91-58-7	2-Chloronaphthalene	ND 1		280	<del></del>
88-74-4	2-Nitroaniline	ND		2400	
208-96-8	Acenaphthylene	ND .		140	· <del></del>
131-11-3	Dimethyl phthalate	ND		280	
606-20-2	2,6-Dinitrotoluene	ND		460	
99-09-2	3-Nitroaniline	ND		2400	
83-32-9	Acenaphthene	ND		140	
51-28-5	2,4-Dinitrophenol	ND		2400	
132-64-9	Dibenzofuran	ND		460	
100-02-7	4-Nitrophenol	ND		2400	

01378

Work Order #: 0002136-010S

**PPS** 

Date Collected: 2/20/2000

000 Test Code:

Date Extracted: 2/28/2000 by tm-1134 Test Name: Pesticides/PCB - Sediment

Date Analyzed: 3/2/2000 by TAITS Sample ID: CP-MW-3-4-6ft

Total Solids: 71%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING :	DILUTION FACTOR
319-84-6	a-BHC	ND		28	1.0
319-85-7	ъ-внс	ND		28	1.0
58-89-9	g-BHC (lindane)	ND		28	1.0
319-86-8	d-BHC	ND		28	1.0
76-44-8	Heptachlor	ND		28	1.0
309-00-2	Aldrin	ND		28	1.0
1024-57-3	Heptachlor epoxide	ND		28	1.0
5103-74-2	g-Chlordane	ND		70	1.0
959-98-8	Endosulfan l	ND		28	1.0
5103-71-9	a-Chlordane	ND	1	70	1.0
60-57-1	Dieldrin	ND		28,	1.0
72-55-9	4,4'-DDE	ND		28	1.0
72-20-8	Endrin	ND		28	1.0
33213-65-9	Endosulfan II	ND		28	1.0
72-54-8	4,4'-DDD	ND	:	28	1.0
7421-93-4	Endrin Aldehyde	ND		28	1.0
1031-07-8	Endosulfan Sulfate	ND		28	1.0
50-29-3	4,4'-DDT	ND	i	28	1.0
53494-70-5	Endrin Ketone	ND		28	1.0
87-82-1	Hexabromobenzene	ND	!	140	1.0
72-43-5	Methoxychlor	ND		70	1.0
2385-85-5	Mirex	ND		70	1.0
59080-40-9	BP-6 (PBB)	ND		350	1.0
12674-11-2	Aroclor 1016 (PCB)	ND		140	1.0
11104-28-2	Aroclor 1221 (PCB)	ND	!	140	1.0
11141-16-5	Aroclor 1232 (PCB)	ND	İ	140	1.0
53469-21-9	Aroclor 1242 (PCB)	ND,		140	1.0
12672-29-6	Aroclor 1248 (PCB)	ND		140	1.0
11097-69-1	Aroclor 1254 (PCB)	ND		140	1.0
11096-82-5	Aroclor 1260 (PCB)	ND		140	1.0
37324-23-5	Aroclor 1262 (PCB)	; ND		140	1.0
11100-14-4	Aroclor 1268 (PCB)	ND	 	140	1.0
8001-35-2	Toxaphene	ND		240	1.0

01379

Work Order #: 0002136-02ME

Date Collected: 2/20/2000

Test Code: SME

Test Name:

MEOH-Sed

Date Analyzed: 2/24/2000 by L1

Sample ID:

CP-MW-3-14-16ft

Total Solids:

60%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
75-71-8	Dichlorodifluoromethane	ND		410	48.9
74-87-3	Chloromethane	ND		410	48.9
75-01-4	Vinyl chloride	ND		160	48.9
74-83-9	Bromomethane	ND	· · · · · · · · · · · · · · · · · · ·	410	48.9
75-00-3	Chloroethane	ND		410	48.9
75-69-4	Trichlorofluoromethane	ND		410	48.9
67-64-1	Acetone	ND		1200	48.9
60-29-7	Diethyl ether	ND		410	48.9
75-35-4	1,1-Dichloroethylene	ND		82	48.9
74-88-4	Methyl iodide	ND		160	48.9
107-13-1	Acrylonitrile	ND		410	48.9
75-09-2	Methylene chloride	ND		410	48.9
75-15-0	Carbon disulfide	ND	 	410	48.9
156-60-5	trans-1,2-Dichloroethylene	ND		. 82	48.9
1634-04-4	Methyltertbutylether (MTBE)	ND		410	48.9
75-34-3	1,1-Dichloroethane	ND		82	48.9
78-93-3	2-Butanone (MEK)	ND		410	48.9
156-59-2	cis-1,2-Dichloroethylene	ND		82	48.9
67-66-3	Chloroform	ND		82	48.9
74-97-5	Bromochloromethane	ND		160	48.9
71-55-6	1,1,1-Trichloroethane	ND		82	48.9
107-06-2	1,2-Dichloroethane	ND		82	48.9
71-43-2	Benzene	ND		82	48.9
56-23-5	Carbon tetrachloride	ND		, 82	48.9
78-87-5	1,2-Dichloropropane	ND	<del> ,</del>	82	48.9
79-01-6	Trichloroethylene	ND		82	48.9
74-95-3	Dibromomethane	ND		160	48.9
75-27-4	Bromodichloromethane	ND		160	48.9
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		410	48.9
10061-01-5	cis-1,3-Dichloropropene	ND		82	48.9
10061-02-6	trans-1,3-Dichloropropene	ND		82	48.9
108-88-3	Toluene	ND i		82	48.9
79-00-5	1,1,2-Trichloroethane	ND		82	48.9
591-78-6	2-Hexanone	ND		410	48.9
124-48-1	Dibromochloromethane	ND		160	48.9
106-93-4	1,2-Dibromoethane	ND		82	48.9

Work Order #: 0002136-02OS

Date Collected: 2/20/2000

Date Analyzed: 3/7/2000

Test Code:

**SBNA** 

Date Extracted: 2/25/2000

by tm-1133

by JRS

Test Name: Sample ID:

BNA - Sediment CP-MW-3-14-16ft

Total Solids:

60%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
62-75-9	N-Nitrosodimethylamine	ND		550	
108-95-2	Phenol	ND		550	
111-44-4	Bis(2-chloroethyl)ether	ND		170	
95-57-8	2-Chlorophenol	ND		550	
541-73-1	1,3-Dichlorobenzene	ND		170	
106-46-7	1,4-Dichlorobenzene	ND		170	
95-50-1	1,2-Dichlorobenzene	ND		170	
95-48-7	2-Methylphenol (o-cresol)	ND		550	· · · · · · · · · · · · · · · · · · ·
108-60-1	Bis(2-chloroisopropyl)ether	ND		170	
108394,106445	3/4-Methylphenol (m/p-cresol)	ND		1100	
621-64-7	N-Nitrosodi-n-propylamine	ND		330	
67-72-1	Hexachloroethane	ND		170	<del></del>
98-95-3	Nitrobenzene	ND		330	
78-59-1	Isophorone	ND		170	
88-75-5	2-Nitrophenol	ND		550	
105-67-9	2,4-Dimethylphenol	ND		550	
111-91-1	Bis(2-chloroethoxy)methane	ND		330	
120-83-2	2,4-Dichlorophenol	ND		550	
120-82-1	1,2,4-Trichlorobenzene	ND		330	
91-20-3	Naphthalene	ND		170	
87-68-3	Hexachlorobutadiene	ND		330	<del></del>
59-50-7	4-Chloro-3-methylphenol	ND		550	-
91-57-6	2-Methylnaphthalene	ND		420	
77-47-4	Hexachlorocyclopentadiene	ND ,		3300:	
88-06-2	2,4,6-Trichlorophenol	ND		550	
95-95-4	2,4,5-Trichlorophenol	ND		550	
91-58-7	2-Chloronaphthalene	ND		330	
88-74-4	2-Nitroaniline	ND		2800	
208-96-8	Acenaphthylene	ND !		170:	
131-11-3	Dimethyl phthalate	ND		330.	
606-20-2	2,6-Dinitrotoluene	ND		550:	
99-09-2	3-Nitroaniline	ND .		2800	
83-32-9	Acenaphthene	ND :		170	
51-28-5	2,4-Dinitrophenol	ND		2800	
132-64-9	Dibenzofuran	ND		550	
100-02-7	4-Nitrophenol	ND		2800	

Work Order #: 0002136-020S

Date Collected: 2/20/2000

Date Extracted: 2/28/2000 by tm-1134

by TAITS

Test Name: Sample ID:

Test Code:

Pesticides/PCB - Sediment

Date Analyzed: 3/2/2000

CP-MW-3-14-16ft

PPS

Total Sotids: 60%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
319-84-6	а-ВНС	ND	!	33:	1.0
319-85-7	ib-BHC	ND	i	33	1.0
58-89-9	g-BHC (lindane)	ND	; 	33!	1.0
319-86-8	ld-BHC	ND	i	33	1.0
76-44-8	Heptachlor	ND	:	33	1.0
309-00-2	Aldrin	ND	1	33	1.0
1024-57-3	Heptachlor epoxide	ND	I	33	1.0
5103-74-2	g-Chlordane	ND		83	1.0
959-98-8	Endosulfan l	ND	:	33	1.0
5103-71-9	a-Chlordane	ND		83	1.0
60-57-1	Dieldrin	ND		33	1.0
72-55-9	4,4'-DDE	ND		33	1.0
72-20-8	Endrin	, ND		33	1.0
33213-65-9	Endosulfan II	ND		. 33	1.0
72-54-8	4,4'-DDD	ND	!	33	1.0
7421-93-4	Endrin Aldehyde	ND		33	1.0
1031-07-8	Endosulfan Sulfate	ND		33	1.0
50-29-3	4,4'-DDT	: ND		33	1.0
53494-70-5	Endrin Ketone	ND	i	33	1.0
87-82-1	Hexabromobenzene	ND	;	170	1.0
72-43-5	Methoxychlor	! ND		83	1.0'
2385-85-5	Mirex	ND	:	83	1.0
59080-40-9	;BP-6 (PBB)	ND		420	1.0
12674-11-2	Aroclor 1016 (PCB)	ND		170:	1.0
11104-28-2	Aroclor 1221 (PCB)	ND		170	1.0
11141-16-5	Aroclor 1232 (PCB)	, ND		170	1.0
53469-21-9	Aroclor 1242 (PCB)	410		170	1.0
12672-29-6	Aroclor 1248 (PCB)	ND	:	170	1.0;
11097-69-1	Aroclor 1254 (PCB)	180		170	1.0!
11096-82-5	Aroclor 1260 (PCB)	ND		170!	1.0
37324-23-5	Aroclor 1262 (PCB)	ND		170	1.0
11100-14-4	Aroclor 1268 (PCB)	ND		170	1.0
8001-35-2	Тохарһепе	ND	;	280	1.0

Work Order #: 0002136-03ME

Date Collected: 2/20/2000

Test Code: SME

Test Name:

MEOH-Sed

Date Analyzed: 2/24/2000 by LI

Sample ID:

CP-MW-3-26-28ft

Total Solids: 71%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
75-71-8	Dichlorodifluoromethane	ND		340	48.5
74-87-3	Chloromethane	ND	:	340	48.5
75-01-4	Vinyl chloride	ND		140	48.5
74-83-9	Bromomethane	ND		340	48.5
75-00-3	Chloroethane	ND	i	340	48.5
75-69-4	Trichlorofluoromethane	ND		340	48.5
67-64-1	Acetone	ND		1000	48.5
60-29-7	Diethyl ether	ND	;	340	48.5
75-35-4	1,1-Dichloroethylene	ND		68	48.5
74-88-4	Methyl iodide	ND		140	48.5
107-13-1	Acrylonitrile	ND		, 340	48.5
75-09-2	Methylene chloride	ND		340	48.5
75-15-0	Carbon disulfide	ND		340	48.5
156-60-5	trans-1,2-Dichloroethylene	ND	<del></del>	. 68	48.5
1634-04-4	Methyltertbutylether (MTBE)	ND		340	48.5
75-34-3	1,1-Dichloroethane	ND		68	48.5
78-93-3	2-Butanone (MEK)	ND		340	48.5
156-59-2	cis-1,2-Dichloroethylene	ND		68	48.5
67-66-3	Chloroform	ND		68	48.5
74-97-5	Bromochloromethane	ND		140	48.5
71-55-6	1,1,1-Trichloroethane	ND		68	48.5
107-06-2	1,2-Dichloroethane	ND		68	48.5
71-43-2	Benzene	ND		68	48.5
56-23-5	Carbon tetrachloride	ND		68	48.5
78-87-5	1,2-Dichloropropane	ND	·	68	48.5
79-01-6	Trichloroethylene	ND	•	68	48.5
74-95-3	Dibromomethane	ND		140	48.5
75-27-4	Bromodichloromethane	ND		140	48.5
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		340	48.5
10061-01-5	cis-1,3-Dichloropropene	ND		68	48.5
10061-02-6	trans-1,3-Dichloropropene	ND		68	48.5
108-88-3	Toluene	ND		68	48.5
79-00-5	1,1,2-Trichloroethane	ND		68	48.5
591-78-6	2-Hexanone	ND		340	48.5
124-48-1	Dibromochloromethane	ND		140	48.5
106-93-4	1,2-Dibromoethane	ND		68	48.5

Work Order #: 0002136-040S

Date Collected: 2/20/2000

Date Analyzed: 3/7/2000

Date Extracted: 2/25/2000 by t

by tm-1133 by JRS Test Code: Test Name: SBNA

est Name: BNA - Sediment

Sample ID: CP-1

CP-MW-3-28-30ft

Total Solids:

45%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
62-75-9	N-Nitrosodimethylamine	ND		730	
108-95-2	Phenol	ND		1 730	
111-44-4	Bis(2-chloroethyl)ether	ND		220	
95-57-8	2-Chlorophenol	ND		730	
541-73-1	1,3-Dichlorobenzene	ND		220	·
106-46-7	1,4-Dichlorobenzene	ND !		220	
95-50-1	1,2-Dichlorobenzene	ND		220	
95-48-7	2-Methylphenol (o-cresol)	ND		730	
108-60-1	Bis(2-chloroisopropyl)ether	ND .		220	
108394,106445	3/4-Methylphenol (m/p-cresol)	ND		1500	
621-64-7	N-Nitrosodi-n-propylamine	ND		440	
67-72-1	Hexachloroethane	ND		220	
98-95-3	Nitrobenzene	ND		440	
78-59-1	lsophorone	ND ,		220	
88-75-5	2-Nitrophenol	ND	.,	730	
105-67-9	2,4-Dimethylphenol	ND		730	
111-91-1	Bis(2-chloroethoxy)methane	ND ·		440	
120-83-2	2,4-Dichlorophenol	ND		730	· -
120-82-1	1,2,4-Trichlorobenzene	ND ,		440	
91-20-3	Naphthalene	ND		220	
87-68-3	Hexachlorobutadiene	ND		440	
59-50-7	4-Chloro-3-methylphenol	ND		. 730	
91-57-6	2-Methylnaphthalene	ND		560	<del></del>
77-47-4	Hexachlorocyclopentadiene	ND		4400	
88-06-2	2,4,6-Trichlorophenol	ND		730	
95-95-4	2,4,5-Trichlorophenol	ND		730	
91-58-7	2-Chloronaphthalene	ND		440	<del>,</del>
88-74-4	2-Nitroaniline	ND		3800	<del></del>
208-96-8	Acenaphthylene	ND		220	
131-11-3	Dimethyl phthalate	ND		440	<del></del>
606-20-2	2,6-Dinitrotoluene	ND		730	······································
99-09-2	3-Nitroaniline	ND		3800	
83-32-9	Acenaphthene	ND		220	· · · · · · · · · · · · · · · · · · ·
51-28-5	2,4-Dinitrophenol	ND		3800	
132-64-9	Dibenzofuran	ND	<u> </u>	730	<del></del>
100-02-7	4-Nitrophenol	ND ;		3800!	

Work Order #: 0002136-040S

Date Collected: 2/20/2000

Test Code: **PPS** 

Date Extracted: 2/28/2000

by tm-1134

by TAITS

Test Name:

Pesticides/PCB - Sediment

Date Analyzed: 3/2/2000

Sample ID:

CP-MW-3-28-30ft

Total Solids: 45%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
319-84-6	a-BHC	! ND		44	1.0
319-85-7	b-BHC	ND		44	1.0
58-89-9	g-BHC (lindane)	ND		44	1.0
319-86-8	d-BHC	ND ·		44	1.0
76-44-8	Heptachlor	ND :		44	1.0
309-00-2	Aldrin	ND		44	1.0
1024-57-3	Heptachlor epoxide	ND		44	1.0
5103-74-2	g-Chlordane	ND		110	1.0
959-98-8	Endosulfan l	ND		44	1.0
5103-71-9	a-Chlordane	ND		110	1.0
60-57-1	Dieldrin	ND		44	1.0
72-55-9	4,4'-DDE	ND		44	1.0
72-20-8	Endrin	ND		44	1.0
33213-65-9	Endosulfan Il	ND		44	1.0
72-54-8	4,4'-DDD	ND :		44	1.0
7421-93-4	Endrin Aldehyde	ND :		44	1.0
1031-07-8	Endosulfan Sulfate	ND		44	1.0
50-29-3	4,4'-DDT	ND	· · · · · · · · · · · · · · · · · · ·	44	1.0
53494-70-5	Endrin Ketone	ND		44	1.0
87-82-1	Hexabromobenzene	ND		220	1.0
72-43-5	Methoxychlor	ND		110	1.0
2385-85-5	Mirex	ND		110	1.0
59080-40-9	BP-6 (PBB)	ND		560	1.0
12674-11-2	Aroclor 1016 (PCB)	ND		220	1.0
11104-28-2	Aroclor 1221 (PCB)	ND ,		220	1.0
11141-16-5	Aroclor 1232 (PCB)	ND		220	1.0
53469-21-9	Aroclor 1242 (PCB)	ND		220	1.0
12672-29-6	Aroclor 1248 (PCB)	· ND		220	1.0
11097-69-1	Aroclor 1254 (PCB)	ND		220	1.0
11096-82-5	Aroclor 1260 (PCB)	ND		220	1.0
37324-23-5	Aroclor 1262 (PCB)	ND		220	1.0
11100-14-4	Aroclor 1268 (PCB)	ND	-	220	1.0
8001-35-2	Toxaphene	ND		380	1.0

01385

Work Order #: 0002136-05ME

Date Collected: 2/21/2000

Test Code:

Test Name:

MEOH-Sed

SME

Date Analyzed: 2/24/2000

by LI

Sample ID:

CP-DB-1-4-6ft

Total Solids: 79%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
75-71-8	Dichlorodifluoromethane	ND		670	105
74-87-3	Chloromethane	ND		670	105
75-01-4	Vinyl chloride	ND	· · · · · · · · · · · · · · · · · · ·	270	105
74-83-9	Bromomethane	ND		670	105
75-00-3	Chloroethane	ND		670	105
75-69-4	Trichlorofluoromethane	ND		670	105
67-64-1	Acetone	ND		2000	105
60-29-7	Diethyl ether	ND		670	105
75-35-4	1,1-Dichloroethylene	ND		130	105
74-88-4	Methyl iodide	ND		270	105
107-13-1	Acrylonitrile	ND		670	105
75-09-2	Methylene chloride	ND		670	105
75-15-0	Carbon disulfide	ND		670	105
156-60-5	trans-1,2-Dichloroethylene	ND		130	105
1634-04-4	Methyltertbutylether (MTBE)	ND		670	105
75-34-3	1,1-Dichloroethane	ND		130	105
78-93-3	2-Butanone (MEK)	ND		670	105
156-59-2	cis-1,2-Dichloroethylene	ND		130	105
67-66-3	Chloroform	ND ;		130	105
74-97-5	Bromochloromethane	ND		270	105
71-55-6	1,1,1-Trichloroethane	ND		130	105
107-06-2	1,2-Dichloroethane	ND		130	105
71-43-2	Benzene	ND		130	105
56-23-5	Carbon tetrachloride	ND		130	105
78-87-5	1,2-Dichloropropane	ND		130	105
79-01-6	Trichloroethylene	ND		130	105
74-95-3	Dibromomethane	ND		270	105
75-27-4	Bromodichloromethane	ND		270	105
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		670	105
10061-01-5	cis-1,3-Dichloropropene	ND		130	105
10061-02-6	trans-1,3-Dichloropropene	ND		130	105
108-88-3	Toluene	ND		130	105
79-00-5	1,1,2-Trichloroethane	ND		130	105
591-78-6	2-Hexanone	ND		670	105
124-48-1	Dibromochloromethane	ND		270	105
106-93-4	1,2-Dibromoethane	ND		130	105

Work Order #: 0002136-050S

Date Collected: 2/21/2000 Date Extracted: 2/25/2000

by tm-1133

**SBNA** Test Code:

Test Name:

BNA - Sediment

Date Analyzed: 3/7/2000

JRS

Sample ID:

CP-DB-1-4-6ft

Total Solids:

79%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
62-75-9	N-Nitrosodimethylamine	ND	<del></del>	420	
108-95-2	:Phenol	ND		420	
111-44-4	Bis(2-chloroethyl)ether	ND		130	
95-57-8	2-Chlorophenol	ND		420	
541-73-1	1,3-Dichlorobenzene	ND		130	
106-46-7	1,4-Dichlorobenzene	ND		130	
95-50-1	1,2-Dichlorobenzene	ND		130	
95-48-7	2-Methylphenol (o-cresol)	ND		420	
108-60-1	Bis(2-chloroisopropyl)ether	ND		130	<del> </del>
108394,106445	3/4-Methylphenol (m/p-cresol)	ND .		840	
621-64-7	N-Nitrosodi-n-propylamine	ND		250	<del></del>
67-72-1	Hexachloroethane	ND		130	
98-95-3	Nitrobenzene	ND	······································	250	
78-59-1	Isophorone	ND		130	
88-75-5	2-Nitrophenol	ND		420	
105-67-9	2,4-Dimethylphenol	ND		420	
111-91-1	Bis(2-chloroethoxy)methane	ND		250	
120-83-2	2,4-Dichlorophenol	ND		420	
120-82-1	1,2,4-Trichlorobenzene	ND		250	
91-20-3	Naphthalene	ND :		130	
87-68-3	Hexachlorobutadiene	ND		250	
59-50-7	4-Chloro-3-methylphenol	ND .		420	
91-57-6	2-Methylnaphthalene	ND		320	
77-47-4	Hexachlorocyclopentadiene	ND		2500	
88-06-2	2,4,6-Trichlorophenol	ND		420	
95-95-4	2,4,5-Trichlorophenol	ND		420	
91-58-7	2-Chloronaphthalene	ND	-	250	
88-74-4	2-Nitroaniline	ND		2200	
208-96-8	Acenaphthylene	ND		130	·
131-11-3	Dimethyl phthalate	ND		250	
606-20-2	2,6-Dinitrotoluene	ND		420	
99-09-2	3-Nitroaniline	ND		2200	
83-32-9	Acenaphthene	ND		130	
51-28-5	2,4-Dinitrophenol	ND		2200	<del></del>
132-64-9	Dibenzofuran	ND		420	
100-02-7	4-Nitrophenol	ND	<del>, </del>	2200	· · · · · · · · · · · · · · · · · · ·

Work Order #: 0002136-050S

Date Collected: 2/21/2000

Date Extracted: 2/28/2000

by tm-1134

Test Code: Test Name:

PPS

Pesticides/PCB - Sediment

Date Analyzed: 3/2/2000 by TAITS Sample ID:

CP-DB-1-4-6ft

Total Solids: 79%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING	DILUTION
			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	LIMIT	FACTOR
319-84-6	а-ВНС	ND		25	1.0
319-85-7	b-BHC	ND		25	1.0
58-89-9	g-BHC (lindane)	. ND		25	1.0
319-86-8	d-BHC	ND		25	1.0
76-44-8	Heptachlor	ND		. 25	1.0
309-00-2	Aldrin	ND		25	1.0
1024-57-3	Heptachlor epoxide	ND		25	1.0
5103-74-2	g-Chlordane	ND		63	1.0:
959-98-8	Endosulfan l	ND		25	1.0
5103-71-9	a-Chlordane	ND		63	1.0
60-57-1	Dieldrin	ND		25	1.0
72-55-9	4,4'-DDE	ND		25.	1.0.
72-20-8	Endrin	ND		25	1.0
33213-65-9	Endosulfan Il	ND		25	1.0
72-54-8	4,4'-DDD	ND		25	1.0
7421-93-4	Endrin Aldehyde	ND		25	1.0
1031-07-8	Endosulfan Sulfate	ND		25	1.0
50-29-3	4,4'-DDT	ND		25	1.0
53494-70-5	Endrin Ketone	ND		25	1.0
87-82-1	Hexabromobenzene	ND		130	1.0
72-43-5	Methoxychlor	ND		63	1.0
2385-85-5	Mirex	ND		63	1.0
59080-40-9	BP-6 (PBB)	ND		320	1.0,
12674-11-2	Aroclor 1016 (PCB)	ND		130	1.0
11104-28-2	Aroclor 1221 (PCB)	ND		130	1.0,
11141-16-5	Aroclor 1232 (PCB)	ND		130	1.0
53469-21-9	Aroclor 1242 (PCB)	ND		130	1.0
12672-29-6	Aroclor 1248 (PCB)	ND		130	1.0
11097-69-1	Aroclor 1254 (PCB)	ND	· - · · ·	130	1.0
11096-82-5	Aroclor 1260 (PCB)	. ND		130	1.0!
37324-23-5	Aroclor 1262 (PCB)	ND		130	1.0
11100-14-4	Aroclor 1268 (PCB)	ND		130	1.0
8001-35-2	Toxaphene	ND		220	1.0

01388

Work Order #: 0002136-06ME

Date Collected: 2/21/2000

Test Code:

**SME** 

by L1

Test Name:

MEOH-Sed

Date Analyzed: 2/24/2000

Sample ID:

CP-DB-1-14-16ft

Total Solids: 71%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
75-71-8	Dichlorodifluoromethane	ND :	····	350	49.9
74-87-3	Chloromethane	ND		350	49.9
75-01-4	Vinyl chloride	ND		140	49.9
74-83-9	Bromomethane	ND :		350	49.9
75-00-3	Chloroethane	ND		350	49.9
75-69-4	Trichlorofluoromethane	ND		350	49.9
67-64-1	Acetone	ND		1100	49.9
60-29-7	Diethyl ether	ND ·		350	49.9
75-35-4	1,1-Dichloroethylene	ND		70	49.9
74-88-4	Methyl iodide	ND		140	49.9
107-13-1	Acrylonitrile	ND .		350	49.9
75-09-2	Methylene chloride	ND		350	49.9
75-15-0	Carbon disulfide	ND		350	49.9
156-60-5	:trans-1,2-Dichloroethylene	ND		70	49.9
1634-04-4	Methyltertbutylether (MTBE)	ND.	<u> </u>	350	49.9
75-34-3	1,1-Dichloroethane	ND		70	49.9
78-93-3	2-Butanone (MEK)	ND		350	49.9
156-59-2	cis-1,2-Dichloroethylene	ND		70	49.9
67-66-3	Chloroform	150		70	49.9
74-97-5	Bromochloromethane	ND		140	49.9
71-55-6	1,1,1-Trichloroethane	ND		70	49.9
107-06-2	1,2-Dichloroethane	ND		70	49.9
71-43-2	Benzene	ND		70	49.9
56-23-5	Carbon tetrachloride	ND		70	49.9
78-87-5	1,2-Dichloropropane	ND		; 70	49.9
79-01-6	Trichloroethylene	ND		70,	49.9
74-95-3	Dibromomethane	ND		140	49.9
75-27-4	Bromodichloromethane	ND		140	49.9
108-10-1	4-Methyl-2-pentanone (MIBK)	ND :		350	49.9
10061-01-5	cis-1,3-Dichloropropene	ND		70	49.9
10061-02-6	trans-1,3-Dichloropropene	ND		70	49.9
108-88-3	Toluene	ND ·		70:	49.9
79-00-5	1,1,2-Trichloroethane	ND		70;	49.9
591-78-6	2-Hexanone	ND :		350	49.9
124-48-1	Dibromochloromethane	ND		140	49.9
106-93-4	1,2-Dibromoethane	ND :		70	49.9

Work Order #: 0002136-06OS

Date Collected: 2/21/2000

Test Code:

SBNA

Date Extracted: 2/25/2000

Test Name:

BNA - Sediment

Date Analyzed: 3/7/2000

by JRS

by tm-1133

Sample ID:

CP-DB-1-14-16ft

Total Solids:

71%

CAS #   COMPOUND   Ug/Kg (dry)   REMARK   REPORTING   LIMIT	
62-75-9         N-Nitrosodimethylamine         ND           108-95-2         Phenol         ND           111-44-4         Bis(2-chloroethyl)ether         ND           95-57-8         2-Chlorophenol         ND           541-73-1          1,3-Dichlorobenzene         ND           106-46-7          1,4-Dichlorobenzene         ND           95-50-1          1,2-Dichlorobenzene         ND           95-48-7          2-Methylphenol (o-cresol)         ND           108-60-1         Bis(2-chloroisopropyl)ether         ND           108394,106445          3/4-Methylphenol (m/p-cresol)         ND           621-64-7          N-Nitrosodi-n-propylamine         ND           67-72-1           Hexachloroethane         ND           98-95-3           Nitrobenzene         ND	NG DILUTION FACTOR
111-44-4   Bis(2-chloroethyl)ether   ND	460
95-57-8        2-Chlorophenol       ND         541-73-1        1,3-Dichlorobenzene       ND         106-46-7        1,4-Dichlorobenzene       ND         95-50-1        1,2-Dichlorobenzene       ND         95-48-7        2-Methylphenol (o-cresol)       ND         108-60-1        Bis(2-chloroisopropyl)ether       ND         108394,106445        3/4-Methylphenol (m/p-cresol)       ND         621-64-7        N-Nitrosodi-n-propylamine       ND         67-72-1        Hexachloroethane       ND         98-95-3        Nitrobenzene       ND	460
541-73-1         1,3-Dichlorobenzene       ND         106-46-7         1,4-Dichlorobenzene       ND         95-50-1         1,2-Dichlorobenzene       ND         95-48-7         2-Methylphenol (o-cresol)       ND         108-60-1         Bis(2-chloroisopropyl)ether       ND         108394,106445         3/4-Methylphenol (m/p-cresol)       ND         621-64-7         N-Nitrosodi-n-propylamine       ND         67-72-1         Hexachloroethane       ND         98-95-3         Nitrobenzene       ND	140
106-46-7         1,4-Dichlorobenzene       ND         95-50-1         1,2-Dichlorobenzene       ND         95-48-7         2-Methylphenol (o-cresol)       ND         108-60-1         Bis(2-chloroisopropyl)ether       ND         108394,106445         3/4-Methylphenol (m/p-cresol)       ND         621-64-7         N-Nitrosodi-n-propylamine       ND         67-72-1         Hexachloroethane       ND         98-95-3         Nitrobenzene       ND	460
95-50-1       1,2-Dichlorobenzene       ND         95-48-7       2-Methylphenol (o-cresol)       ND         108-60-1       Bis(2-chloroisopropyl)ether       ND         108394,106445        3/4-Methylphenol (m/p-cresol)       ND         621-64-7        N-Nitrosodi-n-propylamine       ND         67-72-1        Hexachloroethane       ND         98-95-3        Nitrobenzene       ND	140
95-48-7       2-Methylphenol (o-cresol)       ND         108-60-1       Bis(2-chloroisopropyl)ether       ND         108394,106445       [3/4-Methylphenol (m/p-cresol)       ND         621-64-7       N-Nitrosodi-n-propylamine       ND         67-72-1       Hexachloroethane       ND         98-95-3       Nitrobenzene       ND	140
108-60-1         Bis(2-chloroisopropyl)ether         ND           108394,106445          3/4-Methylphenol (m/p-cresol)         ND           621-64-7          N-Nitrosodi-n-propylamine         ND           67-72-1          Hexachloroethane         ND           98-95-3          Nitrobenzene         ND	140:
108394,106445  3/4-Methylphenol (m/p-cresol) ND 621-64-7  N-Nitrosodi-n-propylamine ND 67-72-1  Hexachloroethane ND 98-95-3  Nitrobenzene ND	460
621-64-7 N-Nitrosodi-n-propylamine ND 67-72-1 Hexachloroethane ND 98-95-3 Nitrobenzene ND	140
621-64-7 N-Nitrosodi-n-propylamine ND 67-72-1 Hexachloroethane ND 98-95-3 Nitrobenzene ND	930
98-95-3 Nitrobenzene ND	280
	140
79 50 1 Usophorone ND	280
76-39-1 130photone 140	140
88-75-5 2-Nitrophenol ND	460
105-67-9  2,4-Dimethylphenol ND	460
111-91-1 Bis(2-chloroethoxy)methane ND	280
120-83-2 2,4-Dichlorophenol ND	460
120-82-1   1,2,4-Trichlorobenzene ND	280
91-20-3 Naphthalene ND	140 <sup>i</sup>
87-68-3 Hexachlorobutadiene ND	280
59-50-7 4-Chloro-3-methylphenol ND	460
91-57-6 i2-Methylnaphthalene ND	350
77-47-4 Hexachlorocyclopentadiene ND	2800 <sup>†</sup>
88-06-2   2,4,6-Trichlorophenol ND	460
95-95-4  2,4,5-Trichlorophenol ND	460
91-58-7 2-Chloronaphthalene ND	280
88-74-4 2-Nitroaniline ND	2400
208-96-8 Acenaphthylene ND	140
131-11-3 Dimethyl phthalate ND	280
606-20-2 2,6-Dinitrotoluene ND	460'
99-09-2 3-Nitroaniline ND	2400
83-32-9 Acenaphthene ND	140
51-28-5 2,4-Dinitrophenol ND	2400
132-64-9   Dibenzofuran ND	460
100-02-7 4-Nitrophenol ND	

Work Order #: 0002136-06OS

Date Collected: 2/21/2000

Date Extracted: 2/28/2000 Date Analyzed: 3/2/2000

by tm-1134 by TAITS Test Name:

PPS

Test Name: Pesticides/PCB - Sediment

Sample 1D:

CP-DB-1-14-16ft

Total Solids: 71%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
319-84-6	a-BHC	ND		28	1.0
319-85-7	b-BHC	ND		28	1.0
58-89-9	g-BHC (lindane)	ND		28	1.0
319-86-8	ld-BHC	, ND		28	1.0
76-44-8	Heptachlor	, ND		28	1.0
309-00-2	Aldrin	ND		28	1.0
1024-57-3	Heptachlor epoxide	ND		28	1.0
5103-74-2	g-Chlordane	ND		70,	1.0
959-98-8	Endosulfan I	ND		28	1.0
5103-71-9	a-Chlordane	ND		70	1.0
60-57-1	Dieldrin	ND		28	1.0
72-55-9	4,4'-DDE	ND		. 28	1.0
72-20-8	!Endrin	ND		28	1.0
33213-65-9	Endosulfan II	ND		28	1.0
72-54-8	4,4'-DDD	, ND		28	1.0
7421-93-4	Endrin Aldehyde	ND		28	1.0
1031-07-8	Endosulfan Sulfate	ND		28	1.0
50-29-3	4,4'-DDT	ND	K	31	1.1
53494-70-5	Endrin Ketone	ND		28	1.0
87-82-1	Hexabromobenzene	ND		140	1.0
72-43-5	Methoxychlor	ND		70	1.0
2385-85-5	Mirex	ND	<del></del>	70	1.0
59080-40-9	iBP-6 (PBB)	ND		350	1.0
12674-11-2	Aroclor 1016 (PCB)	ND		140	1.0
11104-28-2	Aroclor 1221 (PCB)	ND		140;	1.0
11141-16-5	Aroclor 1232 (PCB)	ND		140	1.0
53469-21-9	Aroclor 1242 (PCB)	ND :		140	1.0
12672-29-6	Aroclor 1248 (PCB)	ND		140	1.0
11097-69-1	Aroclor 1254 (PCB)	ND		140	1.0
11096-82-5	Aroclor 1260 (PCB)	ND		140	1.0
37324-23-5	Aroclor 1262 (PCB)	ND		140:	1.0
11100-14-4	Aroclor 1268 (PCB)	ND		140)	1.0
8001-35-2	Toxaphene	ND		240	1.0

KR059B027334

Work Order #: 0002136-07ME

Date Collected: 2/21/2000

Test Code:

by LI

Test Name: Sample ID: MEOH-Sed CP-DB-1-24-26ft

**SME** 

Date Analyzed: 2/24/2000 Total Solids:

62%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
75-71-8	Dichlorodifluoromethane	ND		420	52.0
74-87-3	Chloromethane	ND		420	52.0
75-01-4	Vinyl chloride	ND		170	52.0
74-83-9	'Bromomethane	ND		420	52.0
75-00-3	Chloroethane	ND		420	52.0
75-69-4	Trichlorofluoromethane	ND		420	52.0
67-64-1	Acetone	ND		1300	52.0
60-29-7	Diethyl ether	ND		420	52.0
75-35-4	1,1-Dichloroethylene	ND		84	52.0
74-88-4	Methyl iodide	ND	!	170	52.0
107-13-1	Acrylonitrile	ND		420	52.0
75-09-2	Methylene chloride	ND		420	52.0
75-15-0	Carbon disulfide	ND		420	52.0
156-60-5	trans-1,2-Dichloroethylene	ND		84	52.0
1634-04-4	Methyltertbutylether (MTBE)	ND		420	52.0
75-34-3	1,1-Dichloroethane	ND		84	52.0
78-93-3	2-Butanone (MEK)	ND		420	52.0
156-59-2	cis-1,2-Dichloroethylene	ND		84	52.0
67-66-3	Chloroform	ND		84	52.0
74-97-5	Bromochloromethane	ND		170	52.0
71-55-6	1,1,1-Trichloroethane	ND		84	52.0
107-06-2	1,2-Dichloroethane	ND		84	52.0
71-43-2	Benzene	ND		84	52.0
56-23-5	Carbon tetrachloride	ND		84	52.0
78-87-5	1,2-Dichloropropane	ND		84	52.0
79-01-6	Trichloroethylene	ND	_	84	52.0
74-95-3	Dibromomethane	ND		170	52.0
75-27-4	Bromodichloromethane	ND		170	52.0
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		420'	52.0
10061-01-5	cis-1,3-Dichloropropene	ND		84.	52.0
10061-02-6	trans-1,3-Dichloropropene	ND		84	52.0
108-88-3	Toluene	ND	_	84	52.0
79-00-5	1,1,2-Trichloroethane	ND		84	52.0
591-78-6	2-Hexanone	ND ;		420	52.0
124-48-1	Dibromochloromethane	ND		170	52.0
106-93-4	1,2-Dibromoethane	ND		84:	52.0

Work Order #: 0002136-07OS

Date Collected: 2/21/2000

Date Extracted: 2/25/2000

by tm-1133

SBNA

Test Code: Test Name:

BNA - Sediment

Date Analyzed: 3/7/2000 by JRS

Sample ID:

CP-DB-1-24-26ft

Total Solids: 62%	D
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CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
62-75-9	N-Nitrosodimethylamine	ND ·	<del></del>	530	
108-95-2	Phenol	ND :		530	
111-44-4	Bis(2-chloroethyl)ether	ND		160	
95-57-8	2-Chlorophenol	ND		530	
541-73-1	1,3-Dichlorobenzene	ND		160	<del></del>
106-46-7	1,4-Dichlorobenzene	ND		160	
95-50-1	1,2-Dichlorobenzene	ND		160	
95-48-7	2-Methylphenol (o-cresol)	ND		530	
108-60-1	Bis(2-chloroisopropyl)ether	ND		160	
108394,106445	3/4-Methylphenol (m/p-cresol)	ND :		1100	
621-64-7	N-Nitrosodi-n-propylamine	ND		320	
67-72-1	Hexachloroethane	ND		160	
98-95-3	Nitrobenzene	ND		; 320	·
78-59-1	lsophorone	ND		160	
88-75-5	2-Nitrophenol	ND		530	
105-67-9	2,4-Dimethylphenol	ND	<del></del>	530	
111-91-1	Bis(2-chloroethoxy)methane	ND		320	
120-83-2	2,4-Dichlorophenol	ND		530,	
120-82-1	1,2,4-Trichlorobenzene	ND		320	
91-20-3	Naphthalene	ND		160	
87-68-3	Hexachlorobutadiene	ND		320	
59-50-7	4-Chloro-3-methylphenol	ND		530	
91-57-6	2-Methylnaphthalene	ND :		400	
77-47-4	Hexachlorocyclopentadiene	ND		3200	
88-06-2	2,4,6-Trichlorophenol	ND		530	
95-95-4	2,4,5-Trichlorophenol	ND		530	
91-58-7	2-Chloronaphthalene	ND		320	
88-74-4	2-Nitroaniline	ND		2700	
208-96-8	Acenaphthylene	ND		160	
131-11-3	Dimethyl phthalate	ND	<del></del>	320:	<del></del>
606-20-2	2,6-Dinitrotoluene	ND		530	-
99-09-2	3-Nitroaniline	ND		2700	
83-32-9	Acenaphthene	ND		160	<del></del>
51-28-5	2,4-Dinitrophenol	ND		2700	
132-64-9	Dibenzofuran	ND		530	
100-02-7	4-Nitrophenol	ND	<del></del>	2700	<del></del>

Work Order #: 0002136-07OS

Date Collected: 2/21/2000

Test Code:

Date Extracted: 2/28/2000

by tm-1134 by TAITS

Test Name:

Pesticides/PCB - Sediment

Date Analyzed: 3/2/2000

Sample ID:

CP-DB-1-24-26ft

**PPS** 

Total Solids:

62%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
319-84-6	а-ВНС	. ND		32	1.0
319-85-7	ь-внс	ND !		32	1.0
58-89-9	g-BHC (lindane)	ND .		32	1.0
319-86-8	d-BHC	ND		32	1.0
76-44-8	Heptachlor	ND		32	1.0
309-00-2	Aldrin	ND		32	1.0
1024-57-3	Heptachlor epoxide	ND		32	1.0
5103-74-2	g-Chlordane	ND		81	1.0
959-98-8	Endosulfan l	ND		32	1.0
5103-71-9	a-Chlordane	ND	<del> </del>	81	1.0
60-57-1	Dieldrin	ND		32	1.0
72-55-9	4,4'-DDE	ND		32	1.0
72-20-8	Endrin	ND		32.	1.0
33213-65-9	Endosulfan Il	ND		32	1.0
72-54-8	4,4'-DDD	ND		32	1.0
7421-93-4	Endrin Aldehyde	ND		. 32	1.0
1031-07-8	Endosulfan Sulfate	ND		32	1.0
50-29-3	4,4'-DDT	ND		32	1.0
53494-70-5	Endrin Ketone	ND		32	1.0
87-82-1	Hexabromobenzene	ND		160	1.0
72-43-5	Methoxychlor	, ND		81	1.0
2385-85-5	Mirex	ND		81,	1.0
59080-40-9	BP-6 (PBB)	ND		400	1.0
12674-11-2	Aroclor 1016 (PCB)	ND		160	1.0
11104-28-2	Aroclor 1221 (PCB)	ND		160	1.0
11141-16-5	Aroclor 1232 (PCB)	ND		160	1.0
53469-21-9	Aroclor 1242 (PCB)	ND		160	1.0
12672-29-6	Aroclor 1248 (PCB)	ND		160	1.0
11097-69-1	Aroclor 1254 (PCB)	ND		160	1.0
11096-82-5	Aroclor 1260 (PCB)	ND		160	1.0
37324-23-5	Aroclor 1262 (PCB)	ND		160	1.0
11100-14-4	Aroclor 1268 (PCB)	ND		160	1.0
8001-35-2	Toxaphene	ND		270	1.0

KR059B027337

Work Order #: 0002136-08OS

Date Collected: 2/21/2000

Date Extracted: 2/25/2000

by tm-1133

by JRS

Test Code:

**SBNA** 

Date Analyzed: 3/8/2000

Test Name: Sample ID: BNA - Sediment CP-GS1-1-1.5-2ft

Total Solids:

48%

<u></u>		RESULTS		:	· · · · · · · · · · · · · · · · · · ·
CAS#	COMPOUND	ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
62-75-9	N-Nitrosodimethylamine	ND	!	690	
108-95-2	Phenol	ND		690	
111-44-4	Bis(2-chloroethyl)ether	ND		210	
95-57-8	2-Chlorophenol	ND		690	
541-73-1	1,3-Dichlorobenzene	ND		210	
106-46-7	1,4-Dichlorobenzene	ND		210	
95-50-1	1,2-Dichlorobenzene	ND		210	
95-48-7	2-Methylphenol (o-cresol)	ND		690	
108-60-1	Bis(2-chloroisopropyl)ether	ND		210	
108394,106445	3/4-Methylphenol (m/p-cresol)	ND		1400	
621-64-7	N-Nitrosodi-n-propylamine	ND		420	
67-72-1	Hexachloroethane	ND		210	
98-95-3	Nitrobenzene	ND		420	
78-59-1	lsophorone	ND		210	
88-75-5	2-Nitrophenol	ND		690	
105-67-9	12,4-Dimethylphenol	ND		690 <sub>i</sub>	
111-91-1	Bis(2-chloroethoxy)methane	ND		420	
120-83-2	2,4-Dichlorophenol	ND		690	
120-82-1	1,2,4-Trichlorobenzene	ND		420	1
91-20-3	Naphthalene	240		210	
87-68-3	Hexachlorobutadiene	ND		420	
59-50-7	4-Chloro-3-methylphenol	DN		690	
91-57-6	2-Methylnaphthalene	170	T,J	520	
77-47-4	Hexachlorocyclopentadiene	ND		4200	
88-06-2	2,4,6-Trichlorophenol	ND		690	1
95-95-4	2,4,5-Trichlorophenol	ND		690	1
91-58-7	2-Chloronaphthalene	ND		420	1
88-74-4	2-Nitroaniline	ND		3500	1
208-96-8	Acenaphthylene	150	T	210	1
131-11-3	Dimethyl phthalate	ND		420	1
606-20-2	12,6-Dinitrotoluene	ND :		690	1
99-09-2	3-Nitroaniline	ND		3500	1
83-32-9	Acenaphthene	ND		210	]
51-28-5	2,4-Dinitrophenol	ND :		3500	]
132-64-9	Dibenzofuran	ND		690	]
100-02-7	4-Nitrophenol	ND		3500	1

Work Order #: 0002136-08OS

Date Collected: 2/21/2000

Date Extracted: 2/28/2000

by tm-1134 by

Test Code: Test Name: **SPCB** PCB - Sediment

Date Analyzed: 3/2/2000

**TAITS** 

Sample ID:

CP-GS1-1-1.5-2ft

Total Solids:

48%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
12674-11-2	Aroclor 1016 (PCB)	ND		210	1.
11104-28-2	Aroclor 1221 (PCB)	ND		210	1.
11141-16-5	Aroclor 1232 (PCB)	ND	:	210	1.
53469-21-9	Aroclor 1242 (PCB)	ND	1	210	1.
12672-29-6	Aroclor 1248 (PCB)	ND	i	210	1.
11097-69-1	Aroclor 1254 (PCB)	ND		210	1.
11096-82-5	Aroclor 1260 (PCB)	ND	!	210	1.:
37324-23-5	Aroclor 1262 (PCB)	ND		210	1.
11100-14-4	Aroclor 1268 (PCB)	ND	<del>,</del>	210	1.

ND = not detected at the specified reporting limit.

NM = not measured.

Reference method for pesticides is 8081.

Reference method for PCBs is 8082.

KR059B027339

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
121-14-2	2,4-Dinitrotoluene	: ND		700	
86-73-7	Fluorene	ND		210	
84-66-2	Diethyl phthalate	ND		210	
100-01-6	4-Nitroaniline	ND		3600	
534-52-1	2-Methyl-4,6-dinitrophenol	ND		3600.	
7005-72-3	4-Chlorophenyl phenylether	ND		210	
156-10-5	N-Nitrosodiphenylamine	ND		430	
103-33-3	Azobenzene	ND		430	
101-55-3	4-Bromophenyl phenylether	ND		430	
118-74-1	Hexachlorobenzene	ND		430	
87-86-5	Pentachlorophenol	ND	7200		
85-01-8	Phenanthrene	ND	210		
120-12-7	Anthracene	ND	210		
86-74-8	Carbazole	ND	700		-··
84-74-2	Di-n-butyl phthalate	ND	210		
206-44-0	Fluoranthene	ND		210	
129-00-0	Pyrene	ND		210:	
85-68-7	Butyl benzyl phthalate	ND		210	
56-55-3	Benz(a)anthracene	ND		210	
218-01-9	Chrysene	ND		210'	<del>- 1.0° </del>
117-81-7	Bis(2-ethylhexyl)phthalate	ND		430	
117-84-0	Di-n-octyl phthalate	ND		430	<del></del>
205-99-2	Benzo(b)fluoranthene	ND		430	
207-08-9	Benzo(k)fluoranthene	ND		430	
50-32-8	Benzo(a)pyrene	ND		430	
193-39-5	Indeno(1,2,3-cd)pyrene	ND		430	
53-70-3	Dibenz(a,h)anthracene	ND .		430	
191-24-2	Benzo(g,h,i)perylene	ND .		430	

ND = not detected at the specified reporting limit.

NM = not measured.

Reference method is 8270.

KR059B027340

Work Order #: 0002136-10OS

Date Collected: 2/21/2000

Date Extracted: 2/25/2000

by tm-1133

Test Code: SBNA

Test Name:

BNA - Sediment

Date Analyzed: 3/8/2000

8/2000 by JRS

Sample ID:

CP-GS1-3-1.5-2ft

Total Solids: 55%

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING   LIMIT	DILUTION FACTOR
62-75-9	N-Nitrosodimethylamine	ND		600	
108-95-2	Phenol	ND .		600	· · · · · · · · · · · · · · · · · · ·
111-44-4	Bis(2-chloroethyl)ether	ND		180	
95-57-8	2-Chlorophenol	ND :		600	
541-73-1	1,3-Dichlorobenzene	ND		180	
106-46-7	1,4-Dichlorobenzene	ND		180	
95-50-1	1,2-Dichlorobenzene	ND		180	
95-48-7	2-Methylphenol (o-cresol)	ND		600	
108-60-1	Bis(2-chloroisopropyl)ether	ND		180	
108394,106445	3/4-Methylphenol (m/p-cresol)	ND		1200	
621-64-7	N-Nitrosodi-n-propylamine	ND		360	
67-72-1	Hexachloroethane	ND		180	
98-95-3	Nitrobenzene	ND		360	
78-59-1	Isophorone	ND		180	
88-75-5	2-Nitrophenol	ND .		600	
105-67-9	2,4-Dimethylphenol	ND		600	
111-91-1	Bis(2-chloroethoxy)methane	ND	360		
120-83-2	2,4-Dichlorophenol	ND		600	
120-82-1	1,2,4-Trichlorobenzene	ND	<u></u>	360	
91-20-3	Naphthalene	ND		180	
87-68-3	Hexachlorobutadiene	ND		360	
59-50-7	4-Chloro-3-methylphenol	ND		600	
91-57-6	2-Methylnaphthalene	ND		450	
77-47-4	Hexachlorocyclopentadiene	ND		3600	
88-06-2	2,4,6-Trichlorophenol	ND		600	
95-95-4	2,4,5-Trichlorophenol	ND		600	
91-58-7	2-Chloronaphthalene	ND		1 360	
88-74-4	2-Nitroaniline	ND		3100	
208-96-8	Acenaphthylene	ND		180	
131-11-3	Dimethyl phthalate	ND		360	
606-20-2	2,6-Dinitrotoluene	ND .		600	
99-09-2	3-Nitroaniline	ND		3100	
83-32-9	Acenaphthene	ND		180	
51-28-5	2,4-Dinitrophenol	ND		3100	
132-64-9	Dibenzofuran	ND		600	
100-02-7	4-Nitrophenol	ND	<del></del>	3100	

Work Order #: 0002136-10OS

Date Collected: 2/21/2000

Test Code:

**SPCB** 

Date Extracted: 2/28/2000

by tm-1134

Test Name:

PCB - Sediment

Date Analyzed: 3/2/2000

by TAITS

Sample ID:

CP-GS1-3-1.5-2ft

Total	Solids:	55%
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CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	i	REPORTING I	DILUTION FACTOR
12674-11-2	Aroclor 1016 (PCB)	ND			180	1.0
11104-28-2	Aroclor 1221 (PCB)	ND			180;	1.0
11141-16-5	Aroclor 1232 (PCB)	ND :		į	180	1.0
53469-21-9	Aroclor 1242 (PCB)	ND ,			180	1.0
12672-29-6	Aroclor 1248 (PCB)	ND		-	180	1.0
11097-69-1	Aroclor 1254 (PCB)	ND		i	180	1.0
11096-82-5	Aroclor 1260 (PCB)	ND			180	1.0
37324-23-5	Aroclor 1262 (PCB)	ND			180	1.0
11100-14-4	Aroclor 1268 (PCB)	ND			180	1.0

ND = not detected at the specified reporting limit.

NM = not measured.

Reference method for pesticides is 8081.

Reference method for PCBs is 8082.

CAS#	COMPOUND	RESULTS ug/Kg (dry)	REMARK	REPORTING LIMIT	DILUTION FACTOR
121-14-2	2,4-Dinitrotoluene	ND		610	
86-73-7	Fluorene	ND		190	
84-66-2	Diethyl phthalate	ND		190	
100-01-6	4-Nitroaniline	ND		3100	
534-52-1	2-Methyl-4,6-dinitrophenol	ND :		3100	
7005-72-3	4-Chlorophenyl phenylether	ND		190	
156-10-5	N-Nitrosodiphenylamine	ND		370	
103-33-3	Azobenzene	ND		370	
101-55-3	4-Bromophenyl phenylether	ND		370	
118-74-1	Hexachlorobenzene	ND	<del></del>	370	
87-86-5	Pentachlorophenol	ND		6300	
85-01-8	Phenanthrene	580		190	
120-12-7	Anthracene	190		190	<del></del>
86-74-8	Carbazole	ND	<del></del>	610	
84-74-2	Di-n-butyl phthalate	ND		190	
206-44-0	Fluoranthene	980		190	
129-00-0	Pyrene	1200		190	
85-68-7	Butyl benzyl phthalate	ND		190	
56-55-3	Benz(a)anthracene	640		190	
218-01-9	Chrysene	730		190	
117-81-7	Bis(2-ethylhexyl)phthalate	ND		370	
117-84-0	Di-n-octyl phthalate	ND ;		370	
205-99-2	Benzo(b)fluoranthene	730		370	
207-08-9	Benzo(k)fluoranthene	710.		370	
50-32-8	Benzo(a)pyrene	970,		370	
193-39-5	Indeno(1,2,3-cd)pyrene	340	T	370	
53-70-3	Dibenz(a,h)anthracene	ND		370	
191-24-2	Benzo(g,h,i)perylene	320	T	370	

ND = not detected at the specified reporting limit.

NM = not measured.

Reference method is 8270.

KR059B027343

#### PROCEDURE

NO: PD-13

LABORATORY SERVICES SECTION DATE REV.:10/99

SUBJECT: Laboratory Result Remark Codes

EFFECTIVE DATE: October 1999

- A value reported is the mean of two or more determinations.
- C value calculated from other independent parameters.
- J estimated value or value not accurate.
- K actual value is known to be less than the value given, i.e. substance. if present, is below detection limit.
- L actual value is known to be greater than the value given.
- T value reported is less than criteria of detection.
- W value observed is less than lowest value reportable under "T" cede.
- DL sample analyzed using a dilution(s).
- DM dilution required due to matrix problems.
- HT recommended laboratory holding time was exceeded before analysis.
- LH Q. 0. indicated possible low recovery. Actual level may be higher.
- LL 0. 0. indicated possible high recovery Actual level may be lower.
- MM analytical method or matrix is not within SOP of this laboratory.
- NC no confirmation by a second technique.
- NH non-homogeneous sample made analysis of a representative sample questionable.
- PI possible interference may have affected the accuracy of the laboratory result.
- QC quality control problems exists.
- RB Reagent Blank. The level of reagent blank contamination is reported in the comment column and may be subtracted from the analyte value by the user.
- ST recommended sample collection/preservation technique not used
- ACC laboratory accident resulted in no obtainable value.
- FCN free cyanide was not analyzed due to low level of total cyanide.
- INT interference encountered during analysis resulted in no obtainable value.
- IST Improper sample collection/preservation. Sample not suitable for analysis.
- NAV requested analysis not available.
- QNS quantity not sufficient to perform requested analysis
- STR settleable residue was not analyzed due to low suspended solids.

Approved by:

H-//cen/ 10/20/19

KR059B027344

### DEQ

# MICHIGAN DEPT. OF ENVIRONMENTAL QUALITY ENVIRONMENTAL LABORATORY ANALYSIS REQUEST SHEET

LAB ORDER # 00-02-136			MATRIX=SEI	DIMENT/SOIL/SOLIDS
SUBMITTER DISTRICT DIVISION OR OFFICE	MDEQ PROJEC MANAGER &			ACCEPT HT CODES?
ERD Plainwell	Carol W	eaver_	616-692-263	
LOCATION SAMPLED / SITE ID NUMBER		INDEX	PCA	PROJECT PH
CONSUMERS POWER		47917	30744	454678
COLLECTED BY	PHONE		ADDITIONAL REPORT	
OVERFLOW CONTRACT LAB (Required for ERD)	(517) 324	5047	TO ATTENTION OF	Ken Davis
OVERFLOW CONTRACT LAB (Required for ERD)			l .	(If different than above office)
			1500	o Abbott Rd Stezic
****-SAFETY INFORMATION REC		1 1	E.L	ensing, NJ 48823
SEE BACK OF FORM				
LAB USE SAMPLE IDENTIFICATION ONLY	SAMPLE CO. DATE	TIME_	(	COMMENTS
1/ CP-G31-4-1.5-2'	2-21-00	1830	-	
			<u> </u>	
				·
Control Services			·	
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ORGANIC GE	NERAL CHEN	MISTRY		INORGANIC
VOA VOLATILES GS	TOTAL STATE		MS	
(MeOH/8260) Full List 1 2 3 4 5 6 7 8 9 10 COD	1	234567		NMETALS 1 2 3 4 5 6 7 8 9 10
BTEXMTBE only 1 2 3 4 5 6 7 8 9 10 KJEL N.		234567	8 9 10 (As, Bs, Cd, 8 9 10 Fe Co Li M	. Cr, Cu, Pb, Hg, Sc, Ag, Zn) Mn 1 2 3 4 5 6 7 8 9 10
OS PESTICIDES/PCBS Phenolic Total C	N 1:	234567	8 9 10 Al Be Mo	Ti V 1 2 3 4 5 6 7 8 9 10
(8081/8082) Pesticides & PCBs 1 2 3 4 5 6 7 8 9 10		234567		am 12345678910 12345678910
Pesticides only 1 2 3 4 5 6 7 8 9 10		234567	8 9 10 Ti - Thallium	m 1 2 3 4 5 6 7 8 9 10
PCBs only			Ca Mg Na	K 1 2 3 4 5 6 7 8 9 10
BNA BASE NEUTRAL & ACIDS (8270)			% Total So	1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10
BNAs (1) 2 3 4 5 6 7 8 9 10	•			12345678910
PNAs only 1 2 3 4 5 6 7 8 9 10 BNs only 1 2 3 4 5 6 7 8 9 10				1 2 3 4 5 6 7 8 9 10
***************************************				
SPECIAL REQUESTS Library Search (Qualitative)		•		KR059B027345
Volatiles 1 2 3 4 5 6 7 8 9 10				NNU59B027345
Semivolatiles 1 2 3 4 5 6 7 8 9 10				
Other 1 2 3 4 5 6 7 8 9 10				
BOTTLE /	<del></del>		<u> </u>	
		RECEIV	ED BY / AFFILIATION	DATE & TIME
G C LISTS RELEASED BY AFFILIATION	1			
3				



# MICHIGAN DEPT. OF ENVIRONMENTAL QUALITY ENVIRONMENTAL LABORATORY ANALYSIS REQUEST SHEET

LAB ORDER # 00-02-/36			MATRIX=SE	DIMENT/SOIL/SOLIDS
SUBMITTER DISTRICT DIVISION OR OFFICE	MDEQ PROJ MANAGER &	ECT L PHONE		ACCEPT HT CODES? YES / NO
ERD Plainwell	Carol 1		616-692-2675	
LOCATION SAMPLED / SITE ID NUMBER		INDEX	PCA	PROJECT PH
Consumers Power 390427		47917	30744	454678
COLLECTED BY	PHONE		ADDITIONAL REPORT	
Hens Johannes	(517) 324-	5047	TO ATTENTION OF	Ken Bavi's
OVERFLOW CONTRACT LAB (Required for ERD)			AT (ADDRESS)	(If different than above office)
			1500	o Abbutt Rd, Ste 210
**** SAFETY INFORMATION REC	OUIRED **	**	F.l.	using MT 48823
SEE BACK OF FORM	-	•		10025
LAB USE SAMPLE IDENTIFICATION	SAMPLE C	OLLECTED TIME		COMMENTS
CP-mw-3-4-6'	2-20-00	0900		
2 CP-mw-3-14-16'	1	0930		
3 CP-NW-3-26-28'		1020		,
CP-MW-3-28-30'	V	1620		
5 CP- 18-1-4-6'	2-21-00	1025		
CP-DB-1-14-16		1035		
CP-DB-1-24-26'	V	1106		
8 CP-GS1-1-1.5-2'	2-21-00	1700		
CP-G51-Z-1,5-Z'	1	1730		
10 CP-GS1-3-1.5-2		(800	<u> </u>	
	NERAL CHE	MISTRY		INORGANIC
VOA VOLATILES GS (M=OH/8260) :			MS	
Full List 000 600 8 9 10 COD BTEXMTBE only 1 2 3 4 5 6 7 8 9 10 KJEL N.		234567		NMETALS 400 (5)60 8 9 10 Cr, Cu, Pb, Hg, Se, Ag, Zn)
Phenolic	. 1	234567	8 9 10 Fe Co Li 1	Mn 1 2 3 4 5 6 7 8 9 10
OS PESTICIDES/PCBS Total CI		234567		
(8081/8082) . Pesticides & PCBs		234567		m 12345678910 12345678910
Pesticides only 1 2 3 4 5 6 7 8 9 10	1	2 3 4 5 6 7		
PCBs only 1 2 3 4 5 6 7 (\$15) (0			Ca Mg Na	4 .
BNA BASE NEUTRAL & ACIDS (8270)			% Total So	olids 9000 000 00 8 9 10 1 2 3 4 5 6 7 8 9 10
BNAS OPPOSO BO G			·	1 2 3 4 5 6 7 8 9 10
PNAs only 1 2 3 4 5 6 7 8 9 10 BNs only 1 2 3 4 5 6 7 8 9 10				1 2 3 4 5 6 7 8 9 10
SPECIAL REQUESTS				
Library Search (Qualitative)				
Volatiles 1 2 3 4 5 6 7 8 9 10 Semivolatiles 1 2 3 4 5 6 7 8 9 10				
Other				
1 2 3 4 5 6 7 8 9 10				
BOTTLE/ TESTS RELEASED BY / AFFILIATION		RECEIV	ED BY / AFFILIATION	DATE & TIME
TESTS RELEASED BY AFFILIATION		A		2-32-00
Custody (1)		Luy X	Me_	12400
		• -		



# MICHIGAN DEPT. OF ENVIRONMENTAL QUALITY ENVIRONMENTAL LABORATORY ANALYSIS REGULEST SHEET

LAB ORDER# 00-02 - 136	ANADISIS	REQUEST SIT	MATRIX=SEDIMEN	NT/SOIL/SOLIDS
SUBMITTER DISTRICT DIVISION OR OFFICE	MDEQ PI MANAGI	OJECT R & PHONE		ACCEPT HT CODES?
ERD Plainnell	•	Weaver	616-692-2675	
LOCATION SAMPLED / SITE ID NUMBER		INDEX	PCA PRO	JECT PH
Consumers Power		47917	30744 454	1678
COLLECTED BY	PHONE		ADDITIONAL REPORT	
Hans Johannes	(517) 37	24-5047	TO ATTENTION OF Ken	Davis
OVERFLOW CONTRACT LAB (Required for ERD)			AT (ADDRESS) (If differ	ent than above office)
			1500 Abl	both Rd Ste ZIC
****-SAFETY INFORMATION	•	***	E. Lansin	19, NJ 48823
SEE BACK OF				<i></i>
LAB USE SAMPLE IDENTIFICATION	SAMPLI DATE	COLLECTED TIME	COMME	NIS
11 CP-G-1- 4-1.5-2'	2-21-0	1830		
2				
3				
Miles				
		<del></del>		
6.00		<del></del>	<del> </del>	
新版子には特別				
8		<del></del>		
10 1,3%				
ORGANIC	GENERAL CI	HEMISTRY		DRGANIC
VOA VOLATILES (McOH/8260)	GS		Ms	
Full List 1 2 3 4 5 6 7 8 9 10  BTEXMTBE only 1 2 3 4 5 6 7 8 9 10	COD KJEL N. Tol. P	1234567	8 9 10 MICH TEN METAL 8 9 10 (Az, Bz, Cd, Cr, Cu, Pi	\$ 1 2 3 4 5 6 7 8 9 10
	Phenolics	1234567	8 9 10 Fe Co Li Mn	1 2 3 4 5 6 7 8 9 10
(808)/8082)	Total CN	1234567	8910 Al Be Mo Ti V 8910 Sr-Strontium	1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10
Pesticides & PCBs 1 2 3 4 5 6 7 8 9 10 Pesticides only 1 2 3 4 5 6 7 8 9 10	<del></del>	1234567		1 2 3 4 5 6 7 8 9 10
PCBs only			Ca Mg Na K	1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10
BNA BASE NEUTRAL & ACIDS (8270)			% Total Solids	1 2 3 4 5 6 7 8 9 10
BNAs (1) 2 3 4 5 6 7 8 9 10				1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10
PNAs only 1 2 3 4 5 6 7 8 9 10 BNs only 1 2 3 4 5 6 7 8 9 10				1 2 3 4 5 6 7 8 9 10
SPECIAL REQUESTS	•			
Library Search (Qualitative) Volatiles 1 2 3 4 5 6 7 8 9 10				
Semivolatiles 1 2 3 4 5 6 7 8 9 10				
Other 1 2 3 4 5 6 7 8 9 10				
BOTTLE/				1
TESTS RELEASED BY AFFE	LIATION	RECEIVE	ED BY / AFFILIATION	DATE & TIME
	LIATION	RECEIVE	ED BY / AFFILIATION	DATE & TIME



JOHN ENGLER, Governor

#### DEPARTMENT OF ENVIRONMENTAL QUALITY

HOLLISTER BUILDING, PO BOX 30473, LANSING MI 48909-7973

RUSSELL J. HARDING, Director

REPLY TO:

LABORATORY SECTION
DRINKING WATER & RADIOLOGICAL
PROTECTION DIVISION
3350 N MARTIN L KING JR BLVD
PO BOX 30270
LANSING MI 48909-7770

1. Copy for your records.	
2. Change in Analysis Request.	
3. Other:	

Sample Receiving

Date

Bldg. #44, Third Floor (Rm 303)

Telephone #: (517) 335-9800 Fax #: (517) 335-9600



# MICHIGAN DEPT. OF ENVIRONMENTAL QUALITY ENVIRONMENTAL LABORATORY ANALYSIS REQUEST SHEET

LAB ORDER#	0002128 🚁			MATRIX=SEDIN	MENT/SOIL/SOLIDS
SUBMITTER DIVISION	DISTRICT OR OFFICE	-	R & PHONE		ACCEPT HT CODEST
ERD	Plainnell ;	Caral		616-692-2675	
LOCATION SAM	PLED / SITE ID NUMBER	T>	INDEX		PROJECT PH
	urs Power / NAV 391		47917		454678
COLLECTED BY	Y	PHONE		ADDITIONAL REPORT	1
Hans Jo	channes ~	517)320 ممر	4-5047	TO ATTENTION OF	Can Devic
	ONTRACT LAB (Required for ERD)		<del></del>	AT (ADDRESS) (If o	different than above ====================================
				1500Abk	oct, Ste Zie
***	*-SAFETY INFORMATION	ON REQUIRED	***	1	
	SEE BACK OF	_			
LAB USE ONLY	SAMPLE IDENTIFICATION	SAMPLE DATE	COLLECTED TIME	CON	MENTS
3.65%	f-mw-2-4-6'	7-19-0	0 1345		
		<del>-   -   -   -   -   -   -   -   -   -  </del>	1430		·
3 C	P-MW-Z-14-16' P-MW-Z-Z0-ZZ'	V	1505		
1					
5 .			.		
6					
7					·
8					
9					·
10			_1		
	RGANIC	GENERAL CH	IEMISTRY		INORGANIC
	ATILES OH/8260)	GS		MS	
(MeU Full List	<b>©</b> 2 <b>23</b> >4 5 6 7 8 9 10	COD	1234567		ETALS (123)4 5 6 7 8 = .
BTEX/MTBE on	ly 12345678910	KJEL N, Tot P	1234567	8 9 10 (As, Ba, Cd, Cr,	Cu, Pb, Hg, Se, Ag, Zn)
OS PEST	TICIDES/PCBS	Phenolics Total CN	1234567	8 9 10 Fe Co Li Mn 8 9 10 Al Be Mo Ti \	1234567E
(8	B081/8082)		1 2 3 4 5 6 7	8 9 10 Sr - Strontium	12345675
Pesticides & PCE			1234567		12345678-
Pesticides only PCBs only	1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10	<del></del>	1 4 3 4 3 0 7	Ca Mg Na K	1 2 3 4 5 6 7 8 F 1 2 3 4 5 6 7 8 F
BNA BASE	E NEUTRAL & ACIDS			% Total Solida	1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10
BNA <sub>3</sub>	(8270) ©25 4 5 6 7 8 9 10				12345678910 12345678915
PNAs only	1 2 3 4 5 6 7 8 9 10			<del></del>	1234567891
BNs only	1 2 3 4 5 6 7 8 9 10				_
SPECI	AL REQUESTS				
Library Search (C					
Volatiles Semivolatiles	1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10				
Other	1 2 3 4 5 6 7 8 9 10				
				·	
1 1	TLE / RELEASED BY / AFF	ILIATION	RECEIV	ED BY / AFFILIATION	DATE & TIME
2 g	danal		OR	125	2200
Chain-of-	1) Cropper		7//	Jan -	
	· · · · · · · · · · · · · · · · · · ·		1 7 7 7		

## DEQ

### MICHIGAN DEPT. OF ENVIRONMENTAL QUALITY ENVIRONMENTAL LABORATORY

ANALYSIS REQUEST SHEET

LAF ORDER # 60-02-12/	ANALYSIS KI	eQUEST SIT		ENT/SOIL/SOLIDS
SUBMITTER DISTRICT DIVISION OR OFFICE	MDEQ PROJ MANAGER	ECT & PHONE		ACCEPT HT CODES? YES / NO
ERD Plainwell	_		616-692-26	75
LOCATION SAMPLED / SITE ID NUMBER		INDEX	PCA PR	OJECT PH
Consumers Power /390427		4791		154678
COLLECTED BY	PHONE		ADDITIONAL REPORT	/
Gordon Parish	(517) 324	-5052		nneth Davis
OVERFLOW CONTRACT LAB (Required for ERD)			1	erent than above office) Abboth Ste Z10
****.SAFETY INFORMATION RE SEE BACK OF FORM	-	**	E.Lana	,, M±48823
LAB USE SAMPLE IDENTIFICATION	SAMPLE C	CLLECTED TIME	COM	ÆNTS
CP-MW-1-4-6'	2-18-∞	10:=	05 + BNA	in same jar
2 CP- mw-1-14-16'	1	1		
CP- MW-1- 24-26'	V	15 %	$\checkmark$	,
				·
5-4-			<u> </u>	
6				
3 CANDO			1	
10			ı	
	NERAL CHE	MISTRY	I	NORGANIC
VOA VOLATILES GS (McOH/8260)			MS	
Full List 123 4 5 6 7 8 9 10 COD	. 1	2345=-		ALS (10345678910
BTEX/MTBE only 1 2 3 4 5 6 7 8 9 10 KJEL N	•	234557	3 9 10 (As, Ba, Cd, Cr, Cu I 9 10 Fe Co Li Mn	Pb, Hg, Se, Ag, Zn) 1 2 3 4 5 6 7 8 9 10
OS PESTICIDES/PCBS Total ( (8081/8082)			3 3 10 Al Be Mo Ti V 7 9 10 Sr - Strontium	1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10
Pesticides & PCBs			3 9 10 Ni - Nickel 3 9 10 Ti - Thallium	1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10
PCBs only 1 2 3 4 5 6 7 8 9 10	<del></del> •	234	Ca Mg Na K	1 2 3 4 5 6 7 8 9 10
BNA BASE NEUTRAL & ACIDS (8270)			% Total Solids	1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10
BNAs				1 2 3 4 5 6 7 8 9 10
PNAs only 1 2 3 4 5 6 7 8 9 10 BNs only 1 2 3 4 5 6 7 8 9 10			<del></del>	_ 12345678910
SPECIAL REQUESTS Library Search (Qualitative) Volatiles 1 2 3 4 5 6 7 8 9 10 Semivolatiles 1 2 3 4 5 6 7 8 9 10 Other  1 2 3 4 5 6 7 8 9 10			·	
BOTTLE / TESTS RELEASED BY / AFFILIATION		RECEIVI	ED BY / AFFILIATION	DATE & TIME
96 / / /	IPE	Clus	1/4 Hute.	3-18-00
5 5	:		(	



#### **APPENDIX H**

## MDEQ LABORATORY FEBRUARY 2000 GROUNDWATER ANALYTICAL DATA



### MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY ENVIRONMENTAL LABORATORY (517) 335-9800

P.O. Box 30270 Lansing, MI 48909

Report To: Environmental Response Div.

District #12

1342 SR-89 W. Ste B

Plainwell, MI 49080-1915

Attn: CAROL WEAVER

Total:

\$5,234.74

Lab Work Order # 0002174

Work Site ID:

**CONSUMER POWER** 

Matrix: Water

Received: 2/25/2000

Reported: 4/5/2000

Client: ER\_PLAINWELL

Number of Samples: 7

-MW-1 CP-MW-2 CP-MW-3 CP-GSI-1

TEST	CP-MW-1	CP-MW-2	CP-MW-3	CP-GSI-1
UNITS				
Arsenic by Furnace - Dissolved	12.2	10.5	3.2	9.2
ug/l (Diss)		:		_
Barium - Dissolved	124	174	207	306
ug/l (Diss)			!	!
Cadmium by Furnace - Dissolved	K 0.2	K 0.2	K 0.2	K 0.2
ug/I (Diss)	 	: :	•	
Chromium by Furnace - Dissolved	K 1.0	K 1.0	K 1.0	K 1.0
ug/l (Diss)		1	:	!
Copper by Furnace - Dissolved	K 1.0	25	1.5	10.6
ug/I (Diss)	!			
Lead by Furnace - Dissolved	1.0	1.2	K 1.0	1.4
ug/l (Diss)		<b>i</b>		:
Mercury - Dissolved	K .2	K .2	K .2	K .2
ug/l (Diss)				· •
Selenium - Dissolved	K 1.0	K 1.0	K 1.0	1.6
ug/l (Diss)			<u> </u>	:
Silver by Furnace - Dissolved	K 0.5	K 0.5	K 0.5	K 0.5
ug/l (Diss)		• •	:	) ·
Zinc - Dissolved	18	19	21	34
ug/l (Diss)		<b>i</b>	•	

TEST	CP-GSI-2	CP-GSI-3	CP-GSI-4	
UNITS		: :		
Arsenic by Furnace - Dissolved	K 1.0	2.8	1.8	
ug/l (Diss)	•	!		Ω -
Barium - Dissolved	193	250	190	
ug/l (Diss)		, i	ļ	
Cadmium by Furnace - Dissolved	K 0.2	K 0.2	K 0.2	7 6
ug/l (Diss)		•	<u>.</u>	<b>A</b> PR #
Chromium by Furnace - Dissolved	K 1.0	K 1.0	K 1.0	T d
ug/l (Diss)				
Copper by Furnace - Dissolved	K 1.0	K 1.0	K 1.0	
ug/l (Diss)				
Lead by Furnace - Dissolved	K 1.0	2.8	K 1.0	
ug/l (Diss)			[ 	

MALCOLM PIRNIE, INC. EAST LANSING MI

Work Order #: 0002174-010B

Date Collected: 2/25/2000

Test Code:

**WBNA** 

Date Extracted: 3/3/2000 Date Analyzed: 3/15/2000

by 4468, MJ JRS

Test Name:

BNA - Water

Sample ID:

	-	RESULTS		ì	
CAS#	COMPOUND	ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
2-75-9	'N-Nitrosodimethylamine	ND		5.0	
08-95-2	Phenol	ND		10	
111-44-4	Bis(2-chloroethyl)ether	ND		1.0	
95-57-8	2-Chlorophenol	ND		. 10	
541-73-1	1,3-Dichlorobenzene	ND		1.0	<u> </u>
106-46-7	1,4-Dichlorobenzene	ND		1.0	
95-50-1	1,2-Dichlorobenzene	ND		1.0	
5-48-7	2-Methylphenol (o-cresol)	ND		10	
108-60-1	Bis(2-chloroisopropyl)ether	ND		1.0	
08394,106445	3/4-Methylphenol (m/p-cresol)	ND		: 20	
521-64-7	N-Nitrosodi-n-propylamine	ND		2.0	······································
57-72-1	Hexachloroethane	ND		1.0	
98-95-3	Nitrobenzene	ND		2.0	<del></del> -
78-59-1	Isophorone	ND		1.0	
38-75-5	2-Nitrophenol	ND		10	<u></u>
05-67-9	2,4-Dimethylphenol	ND		10	
111-91-1	Bis(2-chloroethoxy)methane	ND		2.0	<del></del> ,
120-83-2	2,4-Dichlorophenol	ND		10	
120-82-1	1,2,4-Trichlorobenzene	ND		2.0	<del></del>
91-20-3	Naphthalene	ND		1.0	
87-68-3	Hexachlorobutadiene	ND		2.0	
59-50-7	4-Chloro-3-methylphenol	ND		10	
91-57-6	2-Methylnaphthalene	ND		5.0	<del>-~</del>
77-47-4	Hexachlorocyclopentadiene	ND		10	
88-06-2	2,4,6-Trichlorophenol	ND		10	· · · · · · · · · · · · · · · · ·
95-95-4	2,4,5-Trichlorophenol	ND		10	
91-58-7	2-Chloronaphthalene	ND		2.0	
88-74-4	2-Nitroaniline	ND		20	
208-96-8	Acenaphthylene	ND		1.0	
131-11-3	Dimethyl phthalate	ND :		2.0	
506-20-2	2,6-Dinitrotoluene	ND		5.0	
99-09-2	3-Nitroaniline	ND		20	
33-32-9	Acenaphthene	ND ;		1.0	
51-28-5	2,4-Dinitrophenol	ND		. 50	
132-64-9	Dibenzofuran	ND		5.0	
100-02-7	4-Nitrophenol	ND		50	

Work Order #: 0002174-010N

Date Collected: 2/25/2000

Date Extracted: 3/1/2000 Date Analyzed: 3/8/2000

by 4466, JS by TAITS Test Code: Test Name: PPW

e: Pesticides/PCB - Water

Sample ID:

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING DILUTION LIMIT FACTOR	<u></u>
319-84-6	:a-BHC	ND		0.020	1
319-85-7	ъ-внс	ND		0.020	1
58-89-9	g-BHC (lindane)	ND		0.020	1
319-86-8	d-BHC	ND		0.020	1
76-44-8	Heptachlor	i ND		0.020	1
309-00-2	Aldrin	ND		0.020	1
1024-57-3	Heptachlor epoxide	ND		0.020	1
5103-74-2	g-Chlordane	ND		0.020	1
959-98-8	Endosulfan l	ND	!	0.020	1
5103-71-9	a-Chlordane	ND		0.020	1
60-57-1	Dieldrin	ND		0.020	ì
72-55-9	4,4'-DDE	ND		0.020	1
72-20-8	Endrin	ND		0.020	<u>i</u>
33213-65-9	Endosulfan II	ND		0.050	1
72-54-8	4,4'-DDD	ND		0.020	]
7421-93-4	Endrin Aldehyde	ND		0.050	1
1031-07-8	Endosulfan Sulfate	ND		0.050	1
50-29-3	4,4'-DDT	ND		0.020	1
53494-70-5	Endrin Ketone	ND		0.050	1
87-82-1	Hexabromobenzene	ND		0.020	1
72-43-5	Methoxychlor	ND		0.050	ī
2385-85-5	Mirex	ND		0.020	1
59080-40-9	BP-6 (PBB)	ND		0.050	1
12674-11-2	Aroclor 1016 (PCB)	ND		0.10	ī
11104-28-2	Aroclor 1221 (PCB)	ND		0.10	1
11141-16-5	Aroclor 1232 (PCB)	ND		0.10	1
53469-21-9	Aroclor 1242 (PCB)	ND		0.10	1
12672-29-6	Aroclor 1248 (PCB)	ND		0.10	1
11097-69-1	Aroclor 1254 (PCB)	ND	<del></del>	0.10	1
11096-82-5	Aroclor 1260 (PCB)	ND	<del></del>	0.10	1
37324-23-5	Aroclor 1262 (PCB)	ND	<del></del>	0.10	1
11100-14-4	Aroclor 1268 (PCB)	ND		0.10:	1
8001-35-2	Toxaphene	ND		0.10	1
	Volume (mL)	1000			

Work Order #: 0002174-01POX

Date Collected: 2/25/2000

Test Code:

WPS

8260 Plus - Water

Date Analyzed: 3/3/2000

by BUCHNER

Test Name: Sample ID:

RESULTS							
CAS#	COMPOUND	ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR		
75-71-8	Dichlorodifluoromethane	ND		5.0	TACTOR		
74-87-3	Chloromethane	ND		5.0	~		
75-01-4	Vinyl chloride	41	<del></del>	5.0			
74-83-9	Bromomethane	ND		5.0	<del></del>		
75-00-3	Chloroethane	ND	:	5.0	<del></del>		
75-69-4	Trichlorofluoromethane	ND		5.0			
67-64-1	Acetone	ND		25			
60-29-7	Diethyl ether	ND	·	10			
75-35-4	1,1-Dichloroethylene	ND	:	1.0	<del></del>		
74-88-4	Methyl iodide	ND	:	1.0			
107-13-1	Acrylonitrile	ND		5.0			
75-09-2	Methylene chloride	ND		5.0	<del> </del>		
75-15-0	Carbon disulfide	ND		5.0i			
156-60-5	trans-1,2-Dichloroethylene	ND		1.0			
1634-04-4	Methyltertbutylether (MTBE)	ND		5.0			
75-34-3	1,1-Dichloroethane	ND	:	1.0			
78-93-3	2-Butanone (MEK)	ND	:	5.0			
156-59-2	cis-1,2-Dichloroethylene	2.1	7	1.0			
67-66-3	Chloroform	ND	· · · · · · · · · · · · · · · · · · ·	1.0			
74-97-5	Bromochloromethane	ND	:	1.0	· · · · · · · · · · · · · · · · · · ·		
71-55-6	1,1,1-Trichloroethane	ND	:	1.0			
107-06-2	1,2-Dichloroethane	ND	:	1.0			
71-43-2	Benzene	ND		1.0			
56-23-5	Carbon tetrachloride	ND	i	1.0	··		
78-87-5	1,2-Dichloropropane	ND	;	1.0			
79-01-6	Trichloroethylene	ND	·	1.0			
74-95-3	Dibromomethane	ND	1	1.0	<del></del>		
75-27-4	Bromodichloromethane	ND	!	1.0			
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		5.0			
10061-01-5	cis-1,3-Dichloropropene	ND		1.01			
10061-02-6	trans-1,3-Dichloropropene	ND	i	1.0	<del></del> -		
108-88-3	Toluene	ND		1.0	······································		
79-00-5	1,1,2-Trichloroethane	ND	!	1.0			
591-78-6	2-Hexanone	ND	i	5.0			
124-48-1	Dibromochloromethane	ND	<u> </u>	1.0			
106-93-4	1,2-Dibromoethane	ND	i	1.0			

Work Order #: 0002174-020B

Date Collected: 2/25/2000

Date Extracted: 3/3/2000 by 4468, MJ Test Name:

Test Code:

**WBNA** BNA - Water

JRS Date Analyzed: 3/15/2000

Sample ID:

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING	DILUTION
C110		-6		LIMIT	FACTOR
62-75-9	'N-Nitrosodimethylamine	ND	!	5.0	
108-95-2	Phenol	ND		! 10	
111-44-4	Bis(2-chloroethyl)ether	ND		1.0	
95-57 <b>-8</b>	2-Chlorophenol	ND	: !	10	
541-73-1	1,3-Dichlorobenzene	ND		1.0	
106-46-7	1,4-Dichlorobenzene	ND		1.0	
95-50-1	1,2-Dichlorobenzene	ND	: !	1.0	
95-48-7	2-Methylphenol (o-cresol)	ND		10	
108-60-1	Bis(2-chloroisopropyl)ether	ND		1.0	
108394,106445	3/4-Methylphenol (m/p-cresol)	ND	!	20	
621-64-7	N-Nitrosodi-n-propylamine	ND		2.0	
67-72-1	Hexachloroethane	ND		1.0	
98-95-3	Nitrobenzene	ND		2.0	
78-59-1	Isophorone	ND		1.0	
88-75-5	2-Nitrophenol	ND		10 <sub>i</sub>	:
105-67-9	2,4-Dimethylphenol	ND	<del>                                     </del>	10	
111-91-1	Bis(2-chloroethoxy)methane	ND		2.0	
120-83-2	2,4-Dichlorophenol	ND		10'	1
120-82-1	1,2,4-Trichlorobenzene	ND		2.0	1
91-20-3	Naphthalene	ND		1.0	
87-68-3	Hexachlorobutadiene	ND		2.0	1
59-50-7	4-Chloro-3-methylphenol	ND		10	1
91-57-6	2-Methylnaphthalene	ND		5.0	]
77-47-4	Hexachlorocyclopentadiene	ND	;	10	1
88-06-2	2,4,6-Trichlorophenol	ND	:	10:	
95-95-4	2,4,5-Trichlorophenol	ND		10	]
91-58-7	2-Chloronaphthalene	ND		2.0	]
88-74-4	2-Nitroaniline	ND		20	1
208-96-8	Acenaphthylene	ND		1.0	
131-11-3	Dimethyl phthalate	ND		2.0	]
606-20-2	2,6-Dinitrotoluene	ND ,		5.0	1
99-09-2	3-Nitroaniline	ND	···	20	]
83-32-9	Acenaphthene	ND	· · · · · · · · · · · · · · · · · · ·	1.0	]
51-28-5	2,4-Dinitrophenol	ND		50	1
132-64-9	Dibenzofuran	ND		5.0	]
100-02-7	4-Nitrophenol	ND		50	

Work Order #: 0002174-020N

Date Collected: 2/25/2000

Date Extracted: 3/1/2000

by 4466, JS

Test Code:

Test Name:

Pesticides/PCB - Water

Date Analyzed: 3/8/2000

by TAITS

Sample ID:

CP-MW-2

**PPW** 

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
319-84-6	a-BHC	ND		0.020	
319-85-7	b-BHC	ND		0.020	<del></del>
58-89-9	g-BHC (lindane)	ND		0.020	
319-86-8	d-BHC	ND		0.020	
76-44-8	Heptachlor	ND		0.020	
309-00-2	Aldrin	ND		0.020	
1024-57-3	Heptachlor epoxide	ND	<u> </u>	0.020	
5103-74-2	g-Chlordane	ND		0.020	
959-98-8	Endosulfan I	ND		0.020	
5103-71-9	a-Chlordane	ND		0.020	
60-57-1	Dieldrin	ND		0.020	
72-55-9	4,4'-DDE	ND		0.020	
72-20-8	Endrin	ND		0.020	<del></del>
33213-65-9	Endosulfan II	ND		0.050	
72-54-8	4,4'-DDD	ND		0.020	
7421-93-4	Endrin Aldehyde	ND		0.050	
1031-07-8	Endosulfan Sulfate	ND		0.050	
50-29-3	4,4'-DDT	ND		0.020	
53494-70-5	Endrin Ketone	, ND		0.050	
87-82-1	Hexabromobenzene	ND		0.020	
72-43-5	Methoxychlor	ND		0.050	
2385-85-5	Mirex	ND		0.020	
59080-40-9	BP-6 (PBB)	ND		0.050	
12674-11-2	Aroclor 1016 (PCB)	ND		0.101	
11104-28-2	Aroclor 1221 (PCB)	ND		0.10	
11141-16-5	Aroclor 1232 (PCB)	ND		0.10	
53469-21-9	Aroclor 1242 (PCB)	ND	<del></del>	0.10	
12672-29-6	Aroclor 1248 (PCB)	ND		0.10	
11097-69-1	Aroclor 1254 (PCB)	ND		0.10	
11096-82-5	Aroclor 1260 (PCB)	ND		0.10	
37324-23-5	Aroclor 1262 (PCB)	ND		0.10	· · · · · · · · · · · · · · · · · · ·
11100-14-4	Aroclor 1268 (PCB)	ND	<del></del>	0.10	
8001-35-2	Toxaphene	ND :	· · · · · · · · · · · · · · · · · · ·	0.10	<del></del>
	Volume (mL)	1000;	<del> </del>	<del> </del>	

Work Order #: 0002174-02POX

Date Collected: 2/25/2000

Test Code: **WPS** 

Test Name:

8260 Plus - Water

Date Analyzed: 3/2/2000

by WORM

Sample ID:

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
75-71-8	Dichlorodifluoromethane	ND	;	5.0	PACION
74-87-3	Chloromethane	ND		5.0	
75-01-4	Vinyl chloride	ND		5.0	<del></del>
74-83-9	Bromomethane	ND		5.0	
75-00-3	Chloroethane	ND		5.0	
75-69-4	Trichlorofluoromethane	ND		5.0	
67-64-1	Acetone	ND		25	
60-29-7	Diethyl ether	ND		10	
75-35-4	1,1-Dichloroethylene	ND		1.0	<del></del>
74-88-4	Methyl iodide	ND		1.0	
107-13-1	Acrylonitrile	ND		5.0	
75-09-2	Methylene chloride	ND		5.0	
75-15-0	Carbon disulfide	ND		5.0	
156-60-5	trans-1,2-Dichloroethylene	ND		1.0	
1634-04-4	Methyltertbutylether (MTBE)	ND		5.0	
75-34-3	1,1-Dichloroethane	ND		1.0	
78-93-3	2-Butanone (MEK)	ND		5.0	
156-59-2	cis-1,2-Dichloroethylene	ND		1.0	
67-66-3	Chloroform	ND		1.0	
74-97-5	Bromochloromethane	ND		1.0	
71-55-6	1,1,1-Trichloroethane	ND		1.0	
107-06-2	1,2-Dichloroethane	ND		1.0;	
71-43-2	Benzene	ND	:	1.0	
56-23-5	Carbon tetrachloride	ND		1.0	
78-87-5	1,2-Dichloropropane	ND		1.0	
79-01-6	Trichloroethylene	ND		1.0	
74-95-3	Dibromomethane	ND		1.0	
75-27-4	Bromodichloromethane	ND		1.0	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		5.0	
10061-01-5	cis-1,3-Dichloropropene	ND		1.0	
10061-02-6	trans-1,3-Dichloropropene	ND .		1.0	
108-88-3	Toluene	7.4		1.0	
79-00-5	1,1,2-Trichloroethane	ND .		1.0	
591-78-6	2-Hexanone	ND .		5.0	
124-48-1	Dibromochloromethane	ND		1.0	
106-93-4	1,2-Dibromoethane	ND		1.0	

Work Order #: 0002174-03OB

Date Collected: 2/25/2000

Date Extracted: 3/3/2000

by 4468, MJ

by JRS Date Analyzed: 3/15/2000

Test Code:

**WBNA** 

Test Name: BNA - Water

Sample ID:

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
62-75-9	'N-Nitrosodimethylamine	ND		5.0	
108-95-2	Phenol	ND		10	
111-44-4	Bis(2-chloroethyl)ether	ND		1.0	
95-57-8	2-Chlorophenol	ND		10	
541-73-1	1,3-Dichlorobenzene	ND	<u> </u>	1.0	
106-46-7	1,4-Dichlorobenzene	ND		1.0	•
95-50-1	1,2-Dichlorobenzene	ND	<u> </u>	1.0	
95-48-7	2-Methylphenol (o-cresol)	ND		10	
108-60-1	Bis(2-chloroisopropyl)ether	ND		1.0	
108394,106445	3/4-Methylphenol (m/p-cresol)	ND		20	
621-64-7	N-Nitrosodi-n-propylamine	ND		2.0	
67-72-1	Hexachloroethane	ND	<del>:</del>	1.0	
98-95-3	Nitrobenzene	ND		2.0	
78-59-1	lsophorone	ND		1.0	
88-75-5	2-Nitrophenol	ND		10	
105-67-9	2,4-Dimethylphenol	ND	l	. 10	
111-91-1	Bis(2-chloroethoxy)methane	ND		2.0	
120-83-2	2,4-Dichlorophenol	ND		10	
120-82-1	1,2,4-Trichlorobenzene	ND	!	2.0	
91-20-3	Naphthalene	ND		1.0	
87-68-3	Hexachlorobutadiene	ND	<u>.                                    </u>	2.0	
59-50-7	i4-Chloro-3-methylphenol	ND		10	
91-57-6	2-Methylnaphthalene	ND	1	5.0	
77-47-4	Hexachlorocyclopentadiene	ND		10	
88-06-2	2,4,6-Trichlorophenol	ND		10	
95-95-4	2,4,5-Trichlorophenol	ND	i	10	
91-58-7	2-Chloronaphthalene	ND		2.0	
88-74-4	2-Nitroaniline	ND	_	20	
208-96-8	Acenaphthylene	ND		1.0	
131-11-3	Dimethyl phthalate	ND		2.0	<del></del>
606-20-2	2.6-Dinitrotoluene	ND		5.0	·
99-09-2	3-Nitroaniline	ND		, 20	
83-32-9	Acenaphthene	ND		1.0	
51-28-5	2,4-Dinitrophenol	ND		50	
132-64-9	Dibenzofuran	ND	<del></del>	5.0	
100-02-7	4-Nitrophenol	ND		50	

Work Order #: 0002174-030N

Date Collected: 2/25/2000

Date Extracted: 3/1/2000

by 4466, JS

Test Code:

Test Name:

Pesticides/PCB - Water

Date Analyzed: 3/8/2000 by TAITS Sample

Sample ID: CP-MW-3

**PPW** 

		RESULTS				
CAS#	COMPOUND	ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR	
319-84-6	а-ВНС	ND		0.020	TACTOR	
319-85-7	b-BHC	ND		0.020		
58-89-9	g-BHC (lindane)	ND		0.020		
319-86-8	d-BHC	ND		0.020		
76-44-8	Heptachlor	ND		0.020		
309-00-2	Aldrin	ND		0.020		
1024-57-3	Heptachlor epoxide	ND		0.020		
5103-74-2	g-Chlordane	ND		0.020	· · · · · · · · · · · · · · · · · · ·	
959-98-8	Endosulfan 1	ND		0.020	· · · · · · · · · · · · · · · · · · ·	
5103-71-9	a-Chlordane	ND		0.020	<u> </u>	
60-57-1	Dieldrin	ND		0.020		
72-55-9	4,4'-DDE	: ND		0.020		
72-20-8	Endrin	ND		0.020		
33213-65-9	Endosulfan II	ND		0.051	<del></del>	
72-54-8	4,4'-DDD	ND		0.020		
7421-93-4	Endrin Aldehyde	ND	······································	0.051	<del></del>	
1031-07-8	Endosulfan Sulfate	ND		0.051		
50-29-3	4,4'-DDT	ND		0.020		
53494-70-5	Endrin Ketone	ND		0.051		
87-82-1	Hexabromobenzene	ND		0.020		
72-43-5	Methoxychlor	ND		0.051	<del></del>	
2385-85-5	Mirex	ND	· · · · · · · · · · · · · · · · · · ·	0.020		
59080-40-9	BP-6 (PBB)	ND		0.051		
12674-11-2	Aroclor 1016 (PCB)	ND :		0.10		
11104-28-2	Aroclor 1221 (PCB)	ND		0.10		
11141-16-5	Aroclor 1232 (PCB)	ND		0.10		
53469-21-9	Aroclor 1242 (PCB)	ND	- <del> </del>	0.10		
12672-29-6	'Aroclor 1248 (PCB)	ND		0.10		
11097-69-1	Aroclor 1254 (PCB)	ND		0.10		
11096-82-5	Aroclor 1260 (PCB)	ND		0.10		
37324-23-5	Aroclor 1262 (PCB)	ND		0.10		
11100-14-4	Aroclor 1268 (PCB)	ND		0.10		
8001-35-2	Toxaphene	ND		0.10	<u> </u>	
	Volume (mL)	980				

Work Order #: 0002174-03POX

Date Collected: 2/25/2000

Test Code:

WPS

Date Analyzed: 3/2/2000

by WORM

Test Name: Sample ID:

CP-MW-3

8260 Plus - Water

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING DILUTION LIMIT FACTOR
75-71-8	Dichlorodifluoromethane	ND		5.0,
74-87-3	Chloromethane	ND	:	5.0
75-01-4	Vinyl chloride	ND		5.0
74-83-9	Bromomethane	ND		5.0
75-00-3	Chloroethane	ND		5.0
75-69-4	Trichlorofluoromethane	ND		5.0
67-64-1	Acetone	ND	1	25
60-29-7	Diethyl ether	ND		10
75-35-4	1,1-Dichloroethylene	ND	!	1.0
74-88-4	Methyl iodide	ND	·	1.0
107-13-1	Acrylonitrile	ND	:	5.0
75-09-2	Methylene chloride	ND	<u></u> -	5.0
75-15-0	Carbon disulfide	ND	:	5.0
156-60-5	trans-1,2-Dichloroethylene	ND	;	1.0
1634-04-4	Methyltertbutylether (MTBE)	ND	!	5.0
75-34-3	1,1-Dichloroethane	ND		1.0
78-93-3	2-Butanone (MEK)	ND		5.0¦
156-59-2	cis-1,2-Dichloroethylene	ND		1.0
67-66-3	Chloroform	ND		1.0
74-97-5	Bromochloromethane	ND	:	1.0
71-55-6	1,1,1-Trichloroethane	ND		1.0
107-06-2	1,2-Dichloroethane	ND		1.0
71-43-2	Benzene	ND	i	1.0
56-23-5	Carbon tetrachloride	ND		1.0'
78-87-5	1,2-Dichloropropane	ND		1.0
79-01-6	Trichloroethylene	ND		1.0
74-95-3	Dibromomethane	ND		1.0
75-27-4	Bromodichloromethane	ND		1.0
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		5.0
10061-01-5	cis-1,3-Dichloropropene	ND		1.0
10061-02-6	trans-1,3-Dichloropropene	ND		1.0
108-88-3	Toluene	ND		1.0
79-00-5	1,1,2-Trichloroethane	ND		1.0
591-78-6	2-Hexanone	ND		5.0
124-48-1	Dibromochloromethane	ND		1.0
106-93-4	1,2-Dibromoethane	ND		1.0

Work Order #: 0002174-040B

Date Collected: 2/25/2000

Date Extracted: 3/3/2000
Date Analyzed: 3/17/2000

by 4468, MJ

by JRS

Test Code:

WBNA

Test Name:

BNA - Water

Sample ID:

CP-GSI-1

	i	RESULTS			
CAS#	COMPOUND	ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
52-75-9	N-Nitrosodimethylamine	ND		5.0	
108-95-2	Phenol	ND		10	
111-44-4	Bis(2-chloroethyl)ether	ND		1.0	
95-57-8	2-Chlorophenol	ND		10	
541-73-1	1,3-Dichlorobenzene	ND		1.0	
106-46-7	1,4-Dichlorobenzene	ND		1.0	·
95-50-1	1,2-Dichlorobenzene	ND		1.0	
95-48-7	2-Methylphenol (o-cresol)	ND		10	
108-60-1	Bis(2-chloroisopropyl)ether	ND		1.0	<del></del>
108394,106445	3/4-Methylphenol (m/p-cresol)	ND		20	
621-64-7	N-Nitrosodi-n-propylamine	ND	<u> </u>	2.0	
67-72-1	Hexachloroethane	ND	!	1.0	
98-95-3	Nitrobenzene	ND		2.0	<del></del>
78-59-1	lsophorone	ND		1.0	
88-75-5	2-Nitrophenol	ND		10	
105-67-9	2,4-Dimethylphenol	ND		10	
111-91-1	Bis(2-chloroethoxy)methane	ND		2.0	
120-83-2	2,4-Dichlorophenol	ND		10	
120-82-1	1,2,4-Trichlorobenzene	ND	<u> </u>	2.0	
91-20-3	Naphthalene	ND		1.0	
87-68-3	Hexachlorobutadiene	ND		2.0	
59-50-7	4-Chloro-3-methylphenol	ND		10	
91-57-6	2-Methylnaphthalene	ND		5.0	·- · · · · · · · · · · · · · · · · · ·
77-47-4	Hexachlorocyclopentadiene	ND		10	
88-06-2	2,4,6-Trichlorophenol	ND		10	<del></del>
95-95-4	2,4,5-Trichlorophenol	ND		10	<del></del>
91-58-7	2-Chloronaphthalene	ND		2.0	
88-74-4	2-Nitroaniline	ND		20	
208-96-8	Acenaphthylene	ND		1.0	
131-11-3	Dimethyl phthalate	ND		2.0	
506-20-2	2,6-Dinitrotoluene	ND		5.0	
99-09-2	3-Nitroaniline	ND		20	
83-32-9	Acenaphthene	ND		1.0	·····
51-28-5	2,4-Dinitrophenol	ND		50	
132-64-9	Dibenzofuran	ND		5.0	
100-02-7	4-Nitrophenol	ND		50	

Work Order #: 0002174-040N

Date Collected: 2/25/2000

Test Code:

**PPW** 

Date Extracted: 3/1/2000

by 4466, JS

Test Name:

Pesticides/PCB - Water

Date Analyzed: 3/8/2000

by TAITS

Sample ID:

CP-GSI-1

CAS#	COMPOLIND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
	COMPOUND				
319-84-6	а-ВНС	ND		0.020	
319-85-7	'ь-ВНС	ND		0.020	
58-89-9	g-BHC (lindane)	, ND		0.020	
319-86-8	d-BHC	ND		0.020	
76-44-8	Heptachlor	ND		0.020	
309-00-2	Aldrin	ND		0.020	••
1024-57-3	Heptachlor epoxide	: ND		0.020	
5103-74-2	g-Chlordane	ND		0.020	
959-98-8	Endosulfan I	ND		0.020	
5103-71-9	a-Chlordane	ND	,	0.020	· · · · · · · · · · · · · · · · · · ·
60-57-1	Dieldrin	: ND		0.020	
72-55-9	4,4'-DDE	ND		0.020	
72-20-8	Endrin	ND		0.020	
33213-65-9	Endosulfan II	ND		0.051	
72-54-8	4,4'-DDD	ND		0.020	
7421-93-4	Endrin Aldehyde	ND		0.051	
1031-07-8	Endosulfan Sulfate	ND		0.051	
50-29-3	4,4'-DDT	ND	K	0.031	<del></del>
53494-70-5	Endrin Ketone	ND		0.051	
87-82-1	Hexabromobenzene	ND	K	0.041	<del></del>
72-43-5	Methoxychlor	ND		0.051	
2385-85-5	Mirex	. ND		0.020	
59080-40-9	BP-6 (PBB)	ND		0.051	
12674-11-2	Aroclor 1016 (PCB)	ND		0.10	
11104-28-2	Aroclor 1221 (PCB)	ND		0.10	
11141-16-5	Aroclor 1232 (PCB)	ND		0.10	
53469-21-9	Aroclor 1242 (PCB)	ND		0.10	<del></del>
12672-29-6	Aroclor 1248 (PCB)	ND		0.10	· · · · · · · · · · · · · · · · · · ·
11097-69-1	Aroclor 1254 (PCB)	0.16		0.10	· <del></del>
11096-82-5	Aroclor 1260 (PCB)	ND		0.10	
37324-23-5	Aroclor 1262 (PCB)	, ND		0.10	
11100-14-4	Aroclor 1268 (PCB)	ND		0.10	
3001-35-2	Toxaphene	ND	***************************************	0.10	<del></del>
	Volume (mL)	980			<del></del>

Work Order #: 0002174-04POX

Date Collected: 2/25/2000

Test Code:

**WPS** 

8260 Plus - Water

Date Analyzed: 3/2/2000

by WORM

Test Name: Sample ID:

CP-GSI-1

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
75-71-8	Dichlorodifluoromethane	ND		5.0	
74-87-3	Chloromethane	ND		5.0	<del></del>
75-01-4	Vinyl chloride	ND	,	5.0	
74-83-9	Bromomethane	ND		5.0	
75-00-3	Chloroethane	ND		5.0	
75-69-4	Trichlorofluoromethane	ND		5.0	
67-64-1	Acetone	ND	:	25	
60-29-7	Diethyl ether	ND		10	
75-35-4	1,1-Dichloroethylene	ND	<del>,</del> i	1.0	
74-88-4	Methyl iodide	ND	·	1.0	
107-13-1	Acrylonitrile	ND		5.0	
75-09-2	Methylene chloride	ND	·	5.0	
75-15-0	Carbon disulfide	ND		5.0	
156-60-5	trans-1,2-Dichloroethylene	ND		1.0	
1634-04-4	Methyltertbutylether (MTBE)	ND		5.0	
75-34-3	1,1-Dichloroethane	ND	<del></del>	1.0	
78-93-3	2-Butanone (MEK)	ND	<u> </u>	5.0	
156-59-2	cis-1,2-Dichloroethylene	ND		1.0	
67-66-3	Chloroform	ND		1.0	
74-97-5	Bromochloromethane	ND	:	1.0	
71-55-6	1,1,1-Trichloroethane	ND		1.0	
107-06-2	1,2-Dichloroethane	ND	,	1.0	
71-43-2	Benzene	ND		1.0	
56-23-5	Carbon tetrachloride	ND	:	1.0	
78-87-5	1,2-Dichloropropane	ND		1.0	
79-01-6	Trichloroethylene	ND		1.0	
74-95-3	Dibromomethane	ND	:	1.0	
75-27-4	Bromodichloromethane	ND		1.0	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		5.0	
10061-01-5	cis-1,3-Dichloropropene	ND		1.0	
10061-02-6	trans-1,3-Dichloropropene	ND		1.0	
108-88-3	Toluene	ND		1.0	
79-00-5	1,1,2-Trichloroethane	ND		j 1.0	<del></del>
591-78-6	2-Hexanone	ND		5.0	
124-48-1	Dibromochloromethane	ND	<del></del>	1.0	
106-93-4	1,2-Dibromoethane	ND	<del></del>	1.0	

Work Order #: 0002174-05OB

Date Collected: 2/25/2000

Date Extracted: 3/3/2000

4468, MJ

Test Code: Test Name: **WBNA** 

100-02-7

4-Nitrophenol

BNA - Water CP-GS1-2

Date Analyzed: 3/17/2000 **JRS** by

Sample ID:

RESULTS CAS# **COMPOUND** REMARK REPORTING ug/L DILUTION LIMIT **FACTOR** 62-75-9 N-Nitrosodimethylamine ND 5.1 108-95-2 Phenol ND 10 1 Bis(2-chloroethyl)ether 111-44-4 ND 1.0 ĩ 95-57-8 2-Chlorophenol ND 10 1 1,3-Dichlorobenzene 541-73-1 ND 1.0 1 106-46-7 1.4-Dichlorobenzene ND 1.0 1 95-50-1 1.2-Dichlorobenzene ND 1.0 1 2-Methylphenol (o-cresol) 95-48-7 ND 10 ] Bis(2-chloroisopropyl)ether 108-60-1 ND 1.0 1 3/4-Methylphenol (m/p-cresol) 108394,106445 ND 21 1 N-Nitrosodi-n-propylamine 621-64-7 ND 2.1 1 67-72-1 Hexachloroethane ND 1.0 1 98-95-3 Nitrobenzene ND 2.1 1 78-59-1 Isophorone ND 1.0 1 88-75-5 2-Nitrophenol ND 10 ī, ND 105-67-9 2.4-Dimethylphenol 10 1 Bis(2-chloroethoxy)methane 111-91-1 ND 2.1 1 2.4-Dichlorophenol ND 120-83-2 10 1 120-82-1 1.2.4-Trichlorobenzene ND 2.1 1 91-20-3 Naphthalene ND 1.0 . 1 Hexachlorobutadiene 87-68-3 ND 2.1 1 59-50-7 4-Chloro-3-methylphenol ND 10 1 2-Methylnaphthalene ND 91-57-6 5.1 1 77-47-4 Hexachlorocyclopentadiene ND 10 ī 2.4.6-Trichlorophenol ND 88-06-2 10 1 95-95-4 2,4,5-Trichlorophenol ND 10 1 91-58-7 2-Chloronaphthalene ND 2.1 1 88-74-4 2-Nitroaniline ND 21 1 208-96-8 Acenaphthylene ND 1.0 1 Dimethyl phthalate ND 131-11-3 2.1 1 2,6-Dinitrotoluene 606-20-2 ND 5.1 1 99-09-2 3-Nitroaniline ND 21 ì 1 83-32-9 Acenaphthene ND 1.0 i 1 2,4-Dinitrophenol 51-28-5 ND 51 1 Dibenzofuran 132-64-9 ND 5.1:

ND

51

1

1

Work Order #: 0002174-05ON

Date Collected: 2/25/2000

Test Code: PPW

Date Extracted: 3/1/2000

by 4466, JS Test Name:

Pesticides/PCB - Water

Date Analyzed: 3/8/2000

by TAITS

Sample ID: CF

CP-GSI-2

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
319-84-6	а-ВНС	ND		0.020	
319-85-7	ъ-внс	ND		0.020	
58-89-9	g-BHC (lindane)	ND		0.020	
319-86-8	d-BHC	ND		0.020	
76-44-8	Heptachlor	ND		0.020	
309-00-2	Aldrin	ND	<u> </u>	0.020	
1024-57-3	Heptachlor epoxide	ND		0.020	
5103-74-2	g-Chlordane	ND		0.020	· — · · · · · · · · · · · · · · · · · ·
959-98-8	Endosulfan I	ND		0.020	
5103-71-9	a-Chlordane	ND	· · · · · · · · · · · · · · · · · · ·	0.020	<del></del>
60-57-1	Dieldrin	ND		0.020	
72-55-9	4,4'-DDE	ND		0.020	
72-20-8	Endrin	ND		0.020	
33213-65-9	Endosulfan II	ND		0.050	<del></del>
72-54-8	4,4'-DDD	ND		0.020	
7421-93-4	Endrin Aldehyde	ND		0.050	
1031-07-8	Endosulfan Sulfate	ND	·	0.050	
50-29-3	4,4'-DDT	ND	:	0.020	
53494-70-5	Endrin Ketone	ND		0.050	
87-82-1	Hexabromobenzene	ND		0.020	
72-43-5	Methoxychlor	ND		0.050	
2385-85-5	Mirex	ND		0.020	
59080-40-9	BP-6 (PBB)	ND		0.050	
12674-11-2	Aroclor 1016 (PCB)	ND		0.10	
11104-28-2	Aroclor 1221 (PCB)	ND		0.10	
11141-16-5	Aroclor 1232 (PCB)	ND		0.10	
53469-21-9	Aroclor 1242 (PCB)	ND		0.10	
12672-29-6	Aroclor 1248 (PCB)	ND		0.10	
11097-69-1	Aroclor 1254 (PCB)	ND		0.10	
11096-82-5	Aroclor 1260 (PCB)	ND		0.10	<del></del>
37324-23-5	Aroclor 1262 (PCB)	ND		0.10	<del></del>
11100-14-4	Aroclor 1268 (PCB)	ND		0.10	
8001-35-2	Toxaphene	ND		0.10	
	Volume (mL)	1000			·

Work Order #: 0002174-05POX

Date Collected: 2/25/2000

Test Code:

WPS

8260 Plus - Water

Date Analyzed: 3/2/2000

by WORM

Test Name: Sample ID:

CP-GSI-2

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
75-71-8	Dichlorodifluoromethane	ND		5.0	
74-87-3	Chloromethane	ND		5.0	
75-01-4	Vinyl chloride	ND	·	5.0	
74-83-9	Bromomethane	ND	<u> </u>	5.0	-
75-00-3	Chloroethane	ND	!	, 5.0	
75-69-4	Trichlorofluoromethane	ND		5.0	
67-64-1	Acetone	ND		25	
60-29-7	Diethyl ether	ND	,	10	
75-35-4	1,1-Dichloroethylene	ND	:	1.0	
74-88-4	Methyl iodide	ND	) :	1.0	
107-13-1	Acrylonitrile	ND	<del></del>	5.0	
75-09-2	Methylene chloride	ND		5.0	
75-15-0	Carbon disulfide	ND		5.0	
156-60-5	trans-1,2-Dichloroethylene	ND	:	1.0	
1634-04-4	Methyltertbutylether (MTBE)	ND		5.0	
75-34-3	1,1-Dichloroethane	ND		1.0	-
78-93-3	2-Butanone (MEK)	ND	!	5.0	
156-59-2	cis-1,2-Dichloroethylene	ND		1.0	
67-66-3	Chloroform	ND	·	1.0	,
74-97-5	Bromochloromethane	ND	,	1.0	
71-55-6	1,1,1-Trichloroethane	ND	!	1.0	
107-06-2	1,2-Dichloroethane	ND	i	1.0;	
71-43-2	Benzene	ND	:	1.0	
56-23-5	Carbon tetrachloride	ND		1.0	<del></del>
78-87-5	1,2-Dichloropropane	ND	· !	1.0	
79-01-6	Trichloroethylene	ND		1.0:	
74-95-3	Dibromomethane	ND	i	1.0	
75-27-4	Bromodichloromethane	ND	!	1.0	<del></del>
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		5.0	<del></del>
10061-01-5	cis-1,3-Dichloropropene	ND		1.0	
10061-02-6	trans-1,3-Dichloropropene	ND		1.0	<del></del>
108-88-3	Toluene	ND		1.0.	
79-00-5	1,1,2-Trichloroethane	ND		1.0	
591-78-6	2-Hexanone	ND		5.0	
124-48-1	Dibromochloromethane	ND		1.0	
106-93-4	1,2-Dibromoethane	ND		1.0	

Work Order #: 0002174-060B

Date Collected: 2/25/2000

Test Code:

**WBNA** 

Date Extracted: 3/3/2000

by 4468, MJ

Test Name:

BNA - Water

Date Analyzed: 3/17/2000

JRS

Sample ID:

CP-GS1-3

		RESULTS			
CAS#	COMPOUND	ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
62-75-9	N-Nitrosodimethylamine	ND		. 5.1	
108-95-2	Phenol	ND		10'	
111-44-4	Bis(2-chloroethyl)ether	ND		1.0	
95-57-8	2-Chlorophenol	ND	:	10	
541-73-1	1,3-Dichlorobenzene	ND	· · · · · · · · · · · · · · · · · · ·	1.0	
106-46-7	1,4-Dichlorobenzene	ND	:	1.0	
95-50-1	1,2-Dichlorobenzene	ND		1.0;	
95-48-7	2-Methylphenol (o-cresol)	ND	<u> </u>	10	
108-60-1	Bis(2-chloroisopropyl)ether	ND		1.0	
108394,106445	3/4-Methylphenol (m/p-cresol)	ND		20	
621-64-7	N-Nitrosodi-n-propylamine	ND		2.0;	<del></del>
67-72-1	Hexachloroethane	ND	<u> </u>	1.0	
98-95-3	Nitrobenzene	ND		2.0	······································
78-59-1	lsophorone	ND	1	1.0	
88-75-5	2-Nitrophenol	ND		10	·
105-67-9	2,4-Dimethylphenol	ND	<del>i</del>	10:	<del></del>
111-91-1	Bis(2-chloroethoxy)methane	ND	i	- 2.0	
120-83-2	2,4-Dichlorophenol	ND	<u> </u>	10	<del></del>
120-82-1	1,2,4-Trichlorobenzene	ND	i	2.0 <sub>i</sub>	<del> </del>
91-20-3	Naphthalene	ND	<del></del>	1.0	
87-68-3	Hexachlorobutadiene	ND		2.0	<del></del>
59-50-7	4-Chloro-3-methylphenol	ND	ļ	10;	
91-57-6	2-Methylnaphthalene	ND		5.1	<del></del>
77-47-4	Hexachlorocyclopentadiene	ND	!	10	
88-06-2	2,4,6-Trichlorophenol	ND	i	10;	
95-95-4	2,4,5-Trichlorophenol	ND		10	······································
91-58-7	2-Chloronaphthalene	ND	!	2.0	*** <u>***</u>
88-74-4	2-Nitroaniline	ND	<u> </u>	20	
208-96-8	Acenaphthylene	ND		1.0	
131-11-3	Dimethyl phthalate	ND	i	2.0	
506-20-2	2,6-Dinitrotoluene	ND	:	5.1	
99-09-2	3-Nitroaniline	ND	<del></del>	20	
33-32-9	Acenaphthene	ND	·	1.0	
51-28-5	2,4-Dinitrophenol	ND		51	
132-64-9	Dibenzofuran	ND		5.1	
100-02-7	4-Nitrophenol	ND		51;	

Work Order #: 0002174-060N

Date Collected: 2/25/2000

Date Extracted: 3/1/2000

Test Code:

PPW

Test Name: Pesticides/PCB - Water

Date Analyzed: 3/8/2000

by 4466, JS by TAITS

Sample ID:

CP-GS1-3

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING	DILUTION
C.25		- <b></b> -		LIMIT	FACTOR
319-84-6	a-BHC	ND		0.020	
319-85-7	lb-BHC	ND		0.020	
58-89-9	g-BHC (lindane)	, ND		0.020	
319-86-8	d-BHC	ND		0.020	
76-44-8	Heptachlor	ND		0.020	
309-00-2	Aldrin	, ND		0.020	
1024-57-3	Heptachlor epoxide	ND ;		0.020	
5103-74-2	g-Chlordane	ND		0.020	
959-98-8	Endosulfan l	ND		0.020	
5103-71-9	a-Chlordane	ND .		0.020	
60-57-1	Dieldrin	ND		0.020	
72-55-9	14,4'-DDE	ND		0.020	
72-20-8	Endrin	ND		0.020	
33213-65-9	Endosulfan II	ND		0.050	
72-54-8	4,4'-DDD	ND		0.020	
7421-93-4	Endrin Aldehyde	ND		0.050	
1031-07-8	Endosulfan Sulfate	ND		0.050	
50-29-3	4,4'-DDT	ND		0.020	
53494-70-5	Endrin Ketone	ND		0.050	
87-82-1	Hexabromobenzene	ND		0.020	
72-43-5	Methoxychlor	ND		0.050	
2385-85-5	Mirex	ND		0.020	
59080-40-9	BP-6 (PBB)	- <b>ND</b>		0.050	
12674-11-2	Aroclor 1016 (PCB)	ND		0.10	
11104-28-2	Aroclor 1221 (PCB)	ND		0.10	
11141-16-5	Aroclor 1232 (PCB)	ND		0.10	
53469-21-9	Aroclor 1242 (PCB)	ND		0.10	
12672-29-6	Aroclor 1248 (PCB)	ND		0.10	
11097-69-1	Aroclor 1254 (PCB)	0.16		0.10	
11096-82-5	Aroclor 1260 (PCB)	ND		0.10	·
37324-23-5	Aroclor 1262 (PCB)	ND		0.10	
11100-14-4	Aroclor 1268 (PCB)	ND		0.10	<del></del>
8001-35-2	Toxaphene	ND !		0.10,	·· <del>·······</del>
	Volume (mL)	1000		i i	

Work Order #: 0002174-06POX

Date Collected: 2/25/2000

Test Code:

**WPS** 

Test Name:

8260 Plus - Water

Date Analyzed: 3/2/2000

by WORM

Sample ID:

CP-GSI-3

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING	DILUTION	
75-71-8	Dichlorodifluoromethane	ND		LIMIT	FACTOR	
74-87-3	Chloromethane	ND	:	5.0		
75-01-4	Vinyl chloride		·	5.0	·	
74-83-9	Bromomethane	ND		5.0		
75-00-3	Chloroethane	ND		5.0		
75-69-4	Trichlorofluoromethane	ND	:	5.0!		
67-64-1	Acetone	ND		25		
60-29-7	Diethyl ether	ND		10		
75-35-4	1,1-Dichloroethylene		 :	1.0.		
74-88-4	Methyl iodide	ND		1.0,		
107-13-1	Acrylonitrile	ND		5.0		
75-09-2	Methylene chloride	ND	;	5.0		
75-15-0	Carbon disulfide	ND		5.0		
156-60-5	trans-1,2-Dichloroethylene	ND		1.0'		
1634-04-4	Methyltertbutylether (MTBE)			5.0		
75-34-3	1.1-Dichloroethane	ND	<del></del>	1.0		
78-93-3	2-Butanone (MEK)	ND	<u> </u>	5.01		
156-59-2	cis-1,2-Dichloroethylene	ND	<u>.                                    </u>	1.0		
67-66-3	Chloroform	ND		1.0	<del></del>	
74-97-5	Bromochloromethane	ND	<del></del>	1.0		
71-55-6	1,1,1-Trichloroethane	ND		1.0		
107-06-2	1,2-Dichloroethane	ND	<u>.                                    </u>	1.0		
71-43-2	Benzene	ND	<u> </u>	1.0		
56-23-5	Carbon tetrachloride	ND	!	1.0		
78-87-5	1,2-Dichloropropane	ND		1.0		
79-01-6	Trichloroethylene	ND		1.0		
74-95-3	Dibromomethane	ND		1.0		
75-27-4	Bromodichloromethane	ND		1.0		
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		5.0		
10061-01-5	cis-1,3-Dichloropropene	ND		1.0		
10061-02-6	trans-1,3-Dichloropropene	ND		1.0		
108-88-3	Toluene	ND		1.0		
79-00-5	1,1,2-Trichloroethane	ND		1.0	<del></del>	
591-78-6	2-Hexanone	ND		5.0		
124-48-1	Dibromochloromethane	ND		1.0	<del></del>	
106-93-4	1,2-Dibromoethane	ND		1.0		

Work Order #: 0002174-07POX

Date Collected: 2/25/2000

Test Code:

WPS 8260 Plus - Water

Date Analyzed: 3/3/2000

by BUCHNER

Test Name: Sample ID:

CP-GSI-4

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
75-71-8	Dichlorodifluoromethane	ND		5.0	
74-87-3	Chloromethane	ND		5.0	
75-01-4	Vinyl chloride	78		5.0	<del></del>
74-83-9	Bromomethane	ND	1	5.0	
75-00-3	Chloroethane	ND		5.0	
75-69-4	Trichlorofluoromethane	ND		5.0	
67-64-1	Acetone	ND	<u></u>	25	
50-29-7	Diethyl ether	ND		10	
75-35-4	1,1-Dichloroethylene	ND		1.0	<del></del>
74-88-4	Methyl iodide	ND		1.0	·
107-13-1	Acrylonitrile	ND		5.0	<del></del>
75-09-2	Methylene chloride	ND		5.0	
75-15-0	Carbon disulfide	ND		5.0	<del></del>
156-60-5	trans-1,2-Dichloroethylene	ND		1.0	
1634-04-4	Methyltertbutylether (MTBE)	ND		5.0	
75-34-3	1,1-Dichloroethane	1.5		1.0	
78-93-3	2-Butanone (MEK)	ND		5.0'	
156-59-2	cis-1,2-Dichloroethylene	ND		1.0	
67-66-3	Chloroform	ND		1.0	
74-97-5	Bromochloromethane	ND		1.0	
71-55-6	1,1,1-Trichloroethane	ND		1.0	
107-06-2	1,2-Dichloroethane	ND		1.0	
71-43-2	Benzene	ND		1.0	
56-23-5	Carbon tetrachloride	ND		1.0	
78-87-5	1,2-Dichloropropane	ND		1.0	
79-01-6	Trichloroethylene	ND		1.0	
74-95-3	Dibromomethane	ND		1.0	
75-27-4	Bromodichloromethane	ND		1.0	<del></del>
108-10-1	4-Methyl-2-pentanone (MIBK)	ND !		5.0	
10061-01-5	cis-1,3-Dichloropropene	ND		1.0	· · · · · · · · · · · · · · · · · · ·
10061-02-6	trans-1,3-Dichloropropene	ND		1.0	
108-88-3	Toluene	ND		1.0	<del> </del>
79-00-5	1,1,2-Trichloroethane	ND		1.0	
591-78-6	2-Hexanone	ND		5.0	
124-48-1	Dibromochloromethane	ND		1.0	
106-93-4	1,2-Dibromoethane	ND		1.0	

### **PROCEDURE**

NO: PD-13

LABORATORY SERVICES SECTION DATE REV.:10/99

SUBJECT: Laboratory Result Remark Codes

EFFECTIVE DATE: October 1999

- A value reported is the mean of two or more determinations.
- C value calculated from other independent parameters.
- J estimated value or value not accurate.
- K actual value is known to be less than the value given, i.e. substance. if present, is below detection limit.
- L actual value is known to be greater than the value given.
- T value reported is less than criteria of detection.
- W value observed is less than lowest value reportable under "T" cede.
- DL sample analyzed using a dilution(s).
- DM dilution required due to matrix problems.
- HT recommended laboratory holding time was exceeded before analysis.
- LH Q. 0. indicated possible low recovery. Actual level may be higher.
- LL 0. 0. indicated possible high recovery Actual level may be lower.
- MM analytical method or matrix is not within SOP of this laboratory.
- NC no confirmation by a second technique.
- NH non-homogeneous sample made analysis of a representative sample questionable.
- PI possible interference may have affected the accuracy of the laboratory result.
- QC quality control problems exists.
- RB Reagent Blank. The level of reagent blank contamination is reported in the comment column and may be subtracted from the analyte value by the user.
- ST recommended sample collection/preservation technique not used
- ACC laboratory accident resulted in no obtainable value.
- FCN free cyanide was not analyzed due to low level of total cyanide.
- INT interference encountered during analysis resulted in no obtainable value.
- IST Improper sample collection/preservation. Sample not suitable for analysis.
- NAV requested analysis not available.
- QNS quantity not sufficient to perform requested analysis
- STR settleable residue was not analyzed due to low suspended solids.

Approved by:

KR059B027372

Bob Avery, Lab Director Date

# DEQ

# MICHIGAN DEPT. OF ENVIRONMENTAL QUALITY ENVIRONMENTAL LABORATORY ANALYSIS REQUEST SHEET

LAB ORDER # UUU2 174					MATRIX=WATER	
SUBMITTER DISTRICT DIVISION OR OFFICE		MDEQ PROJ MANAGER			ACCEPT HT CODE	S?
ERD Plainwell				- /616692-26		
LOCATION SAMPLED / SITE ID NUMBER		CHO	INDEX	PCA	PROJECT PH	
Consumers Power / 3905	27		4791	7 30744	454678	
COLLECTED BY		PHONE		ADDITIONAL REPORT		
Hans Johannes		(517) 324	-5047	TO ATTENTION OF	Ken Duris	
OVERFLOW CONTRACT LAB (Required for ERD)	<del></del>			AT (ADDRESS)	(If different than above office)	$\neg$
					00 Abbitt, Ste 210	_
**** SAFETY INFORMAT	ION RE	QUIRED **	**	En	ist Lansing, MI 48"	823
SEE BACK O	F FORM				. J	
LABUSE SAMPLE IDENTIFICATION		SAMPLE C DATE	OLLECTED TIME		COMMENTS	
CP-MW-I		2/25/00	1250			
CP-MW-Z			1320			
CP- MU-3			1355		÷	
CP-GS1-1			1530			
CP-GS1-Z	<u> </u>		1420			
CP-G51-3			1205			3
CP-G51- 4		V	1270	1 VOA Vial	broken.	
8						
10.22				<u> </u>		
ORGANIC		VERAL CHE	MISTRY		INORGANIC	
VOA VOLATILES (624/8260) Full List	DO Die C	-	234567		Metals 123456785	9 10
Full List (PQ)Q)40 5 6 7 8 9 10  BTEX/MTBE only 1 2 3 4 5 6 7 8 9 10	GN NO	-Phos 1	2345671		Field Filtered (DQ) (DQ) (DQ) (DQ) (DQ) (DQ) (DQ) (DQ)	
	Resid	_	2345671	• • • •		
ON PESTICIDES/PCBS (608/8081/8082)	Rend	⊯TDS 1 1	2345671		n Limin High (Low) N METALS (1)(2)(2)(1)(5)(5)(8) 9	9 10
Pesticides & PCBs DOG OO 00 9 10	BOD	Tot 5 day 1	234567	8 9 10 (As, Ba, Cd,	Cr, Cu, Pb, Hg, Se, Ag, Zn)	
Pesticides only 1 2 3 4 5 6 7 8 9 10 PCBs only 1 2 3 4 5 6 7 8 9 10	BOD		2345671			
PCBs only 1 2 3 4 5 6 7 8 9 10	<del></del>	·			Ti V 123456789	
Scan 3 (NPDES Only) 1 2 3 4 5 6 7 8 9 10	CA Chlore	ophyli 1	2 3 4 5 6 7 1	9 10 Ni - Nickel	123456715	
BASE NEUTRAL & ACIDS (625/8270)	GA COD		2345671	Sb - Antimo		
625/82/0) BNA	TOC		2345671			
PNAs only 1 2 3 4 5 6 7 8 9 10	NO3 +		2345671	_	123456785	
BNs only 1 2 3 4 5 6 7 8 9 10 ACIDs only 1 2 3 4 5 6 7 8 9 10	KJEL 1		2345671			
SPECIAL REQUESTS		<del></del> ·		•`.	Da Total Alk 1 2 3 4 5 6 7 8 9	
Library Search (Qualitative)	GG Pheno	olics 1	2345671			
Volstiles 1 2 3 4 5 6 7 8 9 10	GP Pheno		2345671		123456789	
Semivolatiles 1 2 3 4 5 6 7 8 9 10 Other	GB Total		2345671		Grease 1 2 3 4 5 6 7 8 5	9 10
1 2 3 4 5 6 7 8 9 10	Amena	bie CN 1	2345671	9 10		
BOTTLE/		1	N F AFF -	TD DV / ATT 1 - TO -		
TESTS   RNI FASED BY / AFT			KECEIVI	ED BY / AFFILIATION	DATE & TIME	
TESTS RAY EASED BY / AFT	clm Pirnie			15 Sold Sold Sold Sold Sold Sold Sold Sold	of of a dis	۶،
			1	_		



# MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY ENVIRONMENTAL LABORATORY (517) 335-9800

P.O. Box 30270 Lansing, MI 48909

Report To: Environmental Response Div.

District #12

1342 SR-89 W. Ste B RECEIVED

Plainwell, MI 49080-1915

Attn: CAROL WEAVER

OCT 1 7 2000

Lab Work Order # 0007251

Work Site ID:

**CONSUMERS ENERGY** 

Matrix: Water

Received: 7/28/2000

Reported: 10/13/2000

Client: ER\_PLAINWELL

Number of Samples: 6

Total:

\$2,986.92

MALCOLM PIRNIE, INC. EAST LANSING, MI

TEST	CP-GS1-1	CP-GS1-3	CP-GS1-4	CP-MW-1
UNITS			!	
Arsenic by Furnace - Dissolved	4.4	1.6	2.3	17
ug/l (Diss)			İ	
Barium - Dissolved	337 DL	286 DL	156 DL	119 DL
ug/l (Diss)				
Cadmium by Furnace - Dissolved	K 0.2	K 0.2	K 0.2	K 0.2
ug/l (Diss)				
Chromium by Furnace - Dissolved	K 1.0	K 1.0	K 1.0	K 1.0
ug/l (Diss)		[ [ 		
Copper by Furnace - Dissolved	K 1.0	1.7	4.4	K 1.0
ug/l (Diss)				
Lead by Furnace - Dissolved	1.1	3.3	1.0	K 1.0
ug/l (Diss)				
Mercury - Dissolved	K .2	K .2	K .2	K .2
ug/l (Diss)				
Selenium - Dissolved	K 1.0	K 1.0	K 1.0	K 1.0
ug/l (Diss)				
Silver by Furnace - Dissolved	K 0.5	K 0.5	K 0.5	K 0.5
ug/l (Diss)				
Zinc - Dissolved	K 10	16	13	13
ug/l (Diss)				

TEST	CP-MW-2	CP-MW-3	1
UNITS			
Arsenic by Furnace - Dissolved	25	4.4	
ug/l (Diss)			
Barium - Dissolved	196 DL	257 DL	
ug/l (Diss)			
Cadmium by Furnace - Dissolved	K 0.2	K 0.2	
ug/l (Diss)			
Chromium by Furnace - Dissolved	K 1.0	K 1.0	
ug/l (Diss)			
Copper by Furnace - Dissolved	K 1.0	1.2	
ug/l (Diss)			
Lead by Furnace - Dissolved	K 1.0	1.2	
ug/l (Diss)			

Work Order #: 0007251-010N

Date Collected: 7/26/2000

Test Code:

PPW

Date Extracted: 8/1/2000

by w4578 jb

Test Name:

Pesticides/PCB - Water

Date Analyzed: 8/24/2000

by bronsonj

Sample ID:

CP-GS1-1

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
319-84-6	a-BHC	ND		0.021	1
319-85-7	b-BHC	ND		0.021	1
58-89-9	g-BHC (lindane)	ND		0.021	1
319-86-8	d-BHC	ND		0.021	1
76-44-8	Heptachlor	ND		0.021	1
309-00-2	Aldrin	ND		0.021	1
1024-57-3	Heptachlor epoxide	ND	· · · · · · · · · · · · · · · · · · ·	0.021	1
5103-74-2	g-Chlordane	ND		0.021	1
959-98-8	Endosulfan I	ND		0.021	1
5103-71-9	a-Chlordane	ND		0.021	1
60-57-1	Dieldrin	ND		0.021	1
72-55-9	4,4'-DDE	ND		0.021	1
72-20-8	Endrin	ND		0.021	1
33213-65-9	Endosulfan II	ND		0.053	1
72-54-8	4,4'-DDD	ND		0.021	1
7421-93-4	Endrin Aldehyde	ND		0.053	1
1031-07-8	Endosulfan Sulfate	ND		0.053	1
50-29-3	4,4'-DDT	ND	K	0.032	2
53494-70-5	Endrin Ketone	ND		0.053	1
87-82-1	Hexabromobenzene	ND		0.021	1
72-43-5	Methoxychlor	ND		0.053	]
2385-85-5	Mirex	ND		0.021	]
59080-40-9	BP-6 (PBB)	ND		0.053	1
12674-11-2	Aroclor 1016 (PCB)	ND		0.11	1
11104-28-2	Aroclor 1221 (PCB)	ND		0.11	1
11141-16-5	Aroclor 1232 (PCB)	ND		0.11	1
53469-21-9	Aroclor 1242 (PCB)	ND		0.11	1
12672-29-6	Aroclor 1248 (PCB)	ND		0.11	1
11097-69-1	Aroclor 1254 (PCB)	0.14		0.11	1
11096-82-5	Aroclor 1260 (PCB)	ND		0.11	1
37324-23-5	Aroclor 1262 (PCB)	ND		0.11	]
11100-14-4	Aroclor 1268 (PCB)	ND		0.11	1
8001-35-2	Toxaphene	ND		0.11	1
	Volume (mL)	950			

Work Order #: 0007251-01POX

Date Collected: 7/26/2000

Test Code:

**WPS** 

Test Name:

8260 Plus - Water

Da

Date Analyzed:	8/4/2000	by MW	Sample ID:
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1	CP.	G'	S I -	I

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING	DILUTION
				LIMIT	FACTOR
75-71-8	Dichlorodifluoromethane	ND		5.0	
74-87-3	Chloromethane	ND		5.0	
75-01-4	Vinyl chloride	ND		5.0	
74-83-9	Bromomethane	ND		5.0	
75-00-3	Chloroethane	ND		5.0	
75-69-4	Trichlorofluoromethane	ND		5.0	
67-64-1	Acetone	ND		25	
60-29-7	Diethyl ether	ND		10	
75-35-4	1,1-Dichloroethylene	ND		1.0	
74-88-4	Methyl iodide	ND		1.0	
107-13-1	Acrylonitrile	ND		5.0	
75-09-2	Methylene chloride	ND		5.0	
75-15-0	Carbon disulfide	ND		5.0	
156-60-5	trans-1,2-Dichloroethylene	ND		1.0	
1634-04-4	Methyltertbutylether (MTBE)	ND		5.0	
75-34-3	1,1-Dichloroethane	ND		1.0	
78-93-3	2-Butanone (MEK)	ND		5.0	
156-59-2	cis-1,2-Dichloroethylene	ND		1.0	
67-66-3	Chloroform	ND		1.0	
74-97-5	Bromochloromethane	) ND		1.0	
71-55-6	1,1,1-Trichloroethane	ND		1.0	
107-06-2	1,2-Dichloroethane	ND		1.0	
71-43-2	Benzene	ND		1.0	
56-23-5	Carbon tetrachloride	ND		1.0	· · · · · · · · · · · · · · · · · · ·
78-87-5	1,2-Dichloropropane	ND		1.0	
79-01-6	Trichloroethylene	ND		1.0	
74-95-3	Dibromomethane	ND		1.0	
75-27-4	Bromodichloromethane	ND		1.0	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		5.0	
10061-01-5	cis-1,3-Dichloropropene	ND		1.0	·
10061-02-6	trans-1,3-Dichloropropene	ND		1.0	<del></del> -
108-88-3	Toluene	ND		1.0	<del></del>
79-00-5	1,1,2-Trichloroethane	ND		1.0	
591-78-6	2-Hexanone	ND		5.0	
124-48-1	Dibromochloromethane	ND		1.0	
106-93-4	1,2-Dibromoethane	ND		1.0	

Workorder 0007251, Page 5 of 26 Printed 10/13/00 7:56 AM

Work Order #: 0007251-020N

Date Collected: 7/26/2000

Date Extracted: 8/1/2000 by w4578 jb

Test Code: Test Name: PPW
Pesticides/PCB - Water

Date Analyzed: 8/24/2000

by bronsonj

Sample ID:

CP-GS1-3

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
319-84-6	a-BHC	. ND		0.020	
319-85-7	b-BHC	ND		0.020	
58-89-9	g-BHC (lindane)	ND		0.020	
319-86-8	d-BHC	ND		0.020	
76-44-8	Heptachlor	ND		0.020	
309-00-2	Aldrin	ND		0.020	
1024-57-3	Heptachlor epoxide	ND		0.020	
5103-74-2	g-Chlordane	ND		0.020	
959-98-8	Endosulfan I	ND		0.020	
5103-71-9	a-Chlordane	ND	·	0.020	
60-57-1	Dieldrin	ND		0.020	
72-55-9	4,4'-DDE	ND		0.020	
72-20-8	Endrin	ND		0.020	
33213-65-9	Endosulfan II	ND		0.051	
72-54-8	4,4'-DDD	ND		0.020	
7421-93-4	Endrin Aldehyde	ND		0.051	
1031-07-8	Endosulfan Sulfate	ND ND		0.051	<del>-</del>
50-29-3	4,4'-DDT	ND	K	0.030	
53494-70-5	Endrin Ketone	ND		0.051	
87-82-1	Hexabromobenzene	ND		0.020	
72-43-5	Methoxychlor	ND		0.051	
2385-85-5	Mirex	ND		0.020	
59080-40-9	BP-6 (PBB)	ND		0.051	
12674-11-2	Aroclor 1016 (PCB)	ND		0.10	
11104-28-2	Aroclor 1221 (PCB)	ND		0.10	
11141-16-5	Aroclor 1232 (PCB)	ND		0.10	<u> </u>
53469-21-9	Aroclor 1242 (PCB)	ND		0.10	
12672-29-6	Aroclor 1248 (PCB)	ND		0.10	
11097-69-1	Aroclor 1254 (PCB)	0.07	T	0.10	
11096-82-5	Aroclor 1260 (PCB)	ND		0.10	
37324-23-5	Aroclor 1262 (PCB)	ND		0.10	
11100-14-4	Aroclor 1268 (PCB)	ND		0.10	
8001-35-2	Toxaphene	ND		0.10	<del></del>
	Volume (mL)	990			

Work Order #: 0007251-02POX

Date Collected: 7/26/2000

Date Analyzed: 8/2/2000

Test Code:

by WORM

Test Name:

8260 Plus - Water

Sample ID:

CP-GS1-3

WPS

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
75-71-8	Dichlorodifluoromethane	ND		5.0	
74-87-3	Chloromethane	ND		5.0	
75-01-4	Vinyl chloride	ND		5.0	
74-83-9	Bromomethane	ND		5.0	
75-00-3	Chloroethane	ND		5.0	
75-69-4	Trichlorofluoromethane	ND		5.0	
67-64-1	Acetone	ND		25	<del></del>
60-29-7	Diethyl ether	ND		10	
75-35-4	1,1-Dichloroethylene	ND		1.0	
74-88-4	Methyl iodide	ND		1.0	
107-13-1	Acrylonitrile	ND		5.0	
75-09-2	Methylene chloride	ND		5.0	
75-15-0	Carbon disulfide	ND		5.0	
156-60-5	trans-1,2-Dichloroethylene	ND		1.0	
1634-04-4	Methyltertbutylether (MTBE)	ND		5.0	
75-34-3	1,1-Dichloroethane	ND		1.0	
78-93-3	2-Butanone (MEK)	ND		5.0	<del></del>
156-59-2	cis-1,2-Dichloroethylene	ND		1.0	
67-66-3	Chloroform	ND		1.0	
74-97-5	Bromochloromethane	ND		1.0	
71-55-6	1,1,1-Trichloroethane	ND		1.0	
107-06-2	1,2-Dichloroethane	ND		1.0	
71-43-2	Benzene	ND		1.0	
56-23-5	Carbon tetrachloride	ND		1.0	
78-87-5	1,2-Dichloropropane	ND		1.0	<del></del>
79-01-6	Trichloroethylene	ND		1.0	
74-95-3	Dibromomethane	ND	· · · · · · · · · · · · · · · · · · ·	1.0	
75-27-4	Bromodichloromethane	ND		1.0	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		5.0	<del></del>
10061-01-5	cis-1,3-Dichloropropene	ND		1.0	
10061-02-6	trans-1,3-Dichloropropene	ND		1.0	
108-88-3	Toluene	ND		1.0	
79-00-5	1,1,2-Trichloroethane	ND	<del></del>	1.0	
591-78-6	2-Hexanone	ND		5.0	
124-48-1	Dibromochloromethane	ND	<del></del>	1.0	
106-93-4	1,2-Dibromoethane	ND		1.0	

Workorder 0007251, Page 9 of 26 Printed 10/13/00 7:56 AM

Work Order #: 0007251-030N

Date Collected: 7/26/2000

Test Code:

Date Extracted: 8/1/2000

by w4578 jb

Test Name:

Pesticides/PCB - Water

Date Analyzed: 8/24/2000

by bronsonj

Sample ID:

CP-GS1-4

PPW

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING	DILUTION
		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		LIMIT	FACTOR
319-84-6	а-ВНС	ND ND		0.020	
319-85-7	b-BHC	ND		0.020	]
58-89-9	g-BHC (lindane)	ND		0.020	]
319-86-8	d-BHC	ND	······································	0.020	
76-44-8	Heptachlor	ND		0.020	]
309-00-2	Aldrin	ND		0.020	
1024-57-3	Heptachlor epoxide	ND		0.020	
5103-74-2	g-Chlordane	ND		0.020	1
959-98 <b>-8</b>	Endosulfan I	ND		0.020	1
5103-71-9	a-Chlordane	ND		0.020	
60-57-1	Dieldrin	ND		0.020	
72-55-9	4,4'-DDE	ND		0.020	1
72-20-8	Endrin	ND		0.020	1
33213-65-9	Endosulfan II	ND	·	0.051	]
72-54-8	4,4'-DDD	ND		0.020	]
7421-93-4	Endrin Aldehyde	ND		0.051	]
1031-07-8	Endosulfan Sulfate	ND		0.051	j
50-29-3	4,4'-DDT	ND		0.020	1
53494-70-5	Endrin Ketone	ND		0.051	1
87-82-1	Hexabromobenzene	ND		0.020	1
72-43-5	Methoxychlor	ND		0.051	1
2385-85-5	Mirex	ND		0.020	1
59080-40-9	BP-6 (PBB)	ND		0.051	1
12674-11-2	Aroclor 1016 (PCB)	ND		0.10	1
11104-28-2	Aroclor 1221 (PCB)	ND		0.10	1
11141-16-5	Aroclor 1232 (PCB)	ND		0.10	1
53469-21-9	Aroclor 1242 (PCB)	ND		0.10	1
12672-29-6	Aroclor 1248 (PCB)	ND		0.10	1
11097-69-1	Aroclor 1254 (PCB)	ND		0.10	1
11096-82-5	Aroclor 1260 (PCB)	ND	<del></del>	0.10	1
37324-23-5	Aroclor 1262 (PCB)	ND		0.10	1
11100-14-4	Aroclor 1268 (PCB)	ND		0.10	1
8001-35-2	Toxaphene	ND		0.10	1
	Volume (mL)	980		1	<u>^</u>

Work Order #: 0007251-03POX

Date Collected: 7/26/2000

Test Code: W

WPS

Test Name:

8260 Plus - Water

Date Analyzed: 8/2/2000

0 by WORM

Sample ID:

CP-GS1-4

		RESULTS			
CAS#	COMPOUND	ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
75-71-8	Dichlorodifluoromethane	ND		5.0	
74-87-3	Chloromethane	ND		5.0	
75-01-4	Vinyl chloride	80		5.0	
74-83-9	Bromomethane	ND		5.0	. 1
75-00-3	Chloroethane	ND		5.0	1
75-69-4	Trichlorofluoromethane	ND		5.0	
67-64-1	Acetone	ND		25	1
60-29-7	Diethyl ether	ND		10	1
75-35-4	1,1-Dichloroethylene	ND		1.0	
74-88-4	Methyl iodide	ND		1.0	1
107-13-1	Acrylonitrile	ND		5.0	1
75-09-2	Methylene chloride	ND		5.0	1
75-15-0	Carbon disulfide	ND	_	5.0	]
156-60-5	trans-1,2-Dichloroethylene	ND		1.0	1
1634-04-4	Methyltertbutylether (MTBE)	ND		5.0	]
75-34-3	1,1-Dichloroethane	2.3	:	1.0	]
78-93-3	2-Butanone (MEK)	ND		5.0	1
156-59-2	cis-1,2-Dichloroethylene	ND		1.0	
67-66-3	Chloroform	ND		1.0	
74-97-5	Bromochloromethane	ND		1.0	
71-55-6	1,1,1-Trichloroethane	ND		1.0	1
107-06-2	1,2-Dichloroethane	ND		1.0	
71-43-2	Benzene	ND		1.0	
56-23-5	Carbon tetrachloride	ND		1.0	1
78-87-5	1,2-Dichloropropane	ND		1.0	1
79-01-6	Trichloroethylene	ND		1.0	1
74-95-3	Dibromomethane	ND		1.0	1
75-27-4	Bromodichloromethane	ND		1.0	1
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		5.0	1
10061-01-5	cis-1,3-Dichloropropene	ND		1.0	1
10061-02-6	trans-1,3-Dichloropropene	ND		1.0	1
108-88-3	Toluene	ND		1.0	1
79-00-5	1,1,2-Trichloroethane	ND		1.0	1
591-78-6	2-Hexanone	ND		5.0	]
124-48-1	Dibromochloromethane	ND		1.0	]
106-93-4	1,2-Dibromoethane	ND		1.0	]

Workorder 0007251, Page 13 of 26
Printed 10/13/00 7:56 AM

Work Order #: 0007251-040N

Date Collected: 7/26/2000

Date Analyzed: 8/24/2000

Test Code:

**PPW** 

Date Extracted: 8/1/2000

by w4578 jb by bronsonj

Test Name:

Pesticides/PCB - Water

Sample ID:

CP-MW-1

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
319-84-6	a-BHC	ND		0.020	
319-85-7	b-BHC	ND		0.020	
58-89-9	g-BHC (lindane)	ND		0.020	
319-86-8	d-BHC	ND		0.020	
76-44-8	Heptachlor	ND		0.020	
309-00-2	Aldrin	ND		0.020	, <u></u> -
1024-57-3	Heptachlor epoxide	ND		0.020	
5103-74-2	g-Chlordane	ND		0.020	
959-98-8	Endosulfan I	ND		0.020	
5103-71-9	a-Chlordane	ND		0.020	
60-57-1	Dieldrin	ND		0.020	
72-55-9	4,4'-DDE	ND		0.020	· · · · · · · · · · · · · · · · · · ·
72-20-8	Endrin	ND		0.020	
33213-65-9	Endosulfan II	ND		0.051	
72-54-8	4,4'-DDD	ND		0.020	
7421-93-4	Endrin Aldehyde	ND		0.051	
1031-07-8	Endosulfan Sulfate	ND .		0.051	
50-29-3	4,4'-DDT	ND		0.020	
53494-70-5	Endrin Ketone	ND		0.051	
87-82-1	Hexabromobenzene	ND		0.020	
72-43-5	Methoxychlor	ND		0.051	
2385-85-5	Mirex	ND		0.020	
59080-40-9	BP-6 (PBB)	ND		0.051	
12674-11-2	Aroclor 1016 (PCB)	ND .		0.10	
11104-28-2	Aroclor 1221 (PCB)	ND		0.10	
11141-16-5	Aroclor 1232 (PCB)	ND		0.10	
53469-21-9	Aroclor 1242 (PCB)	ND		0.10	
12672-29-6	Aroclor 1248 (PCB)	ND		0.10	
11097-69-1	Aroclor 1254 (PCB)	ND		0.10	
11096-82-5	Aroclor 1260 (PCB)	ND		0.10	
37324-23-5	Aroclor 1262 (PCB)	ND		0.10	
11100-14-4	Aroclor 1268 (PCB)	ND		0.10	
8001-35-2	Toxaphene	ND		0.10	·
	Volume (mL)	990			

Work Order #: 0007251-04POX

Date Collected: 7/26/2000

Test Code: WPS

Test Name:

8260 Plus - Water

Date Analyzed: 8/2/2000

00 by WORM

Sample ID:

CP-MW-1

-			RESULTS	<del></del>		
	CAS#	COMPOUND	ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
7	5-71-8	Dichlorodifluoromethane	ND		5.0	1
7	4-87-3	Chloromethane	ND		5.0	1
7	5-01-4	Vinyl chloride	160		5.0	1
7	4-83-9	Bromomethane	ND		5.0	1
7	5-00-3	Chloroethane	ND		5.0	1
7	5-69-4	Trichlorofluoromethane	ND		5.0	l
6	7-64-1	Acetone	ND		25	1
6	0-29-7	Diethyl ether	ND		10	1
7	5-35-4	1,1-Dichloroethylene	ND		1.0	1
7	4-88-4	Methyl iodide	ND		1.0	1
1	07-13-1	Acrylonitrile	ND		5.0	1
7	5-09-2	Methylene chloride	ND		5.0	1
7	5-15-0	Carbon disulfide	ND !		5.0	1
	56-60-5	trans-1,2-Dichloroethylene	ND		1.0	1
1	634-04-4	Methyltertbutylether (MTBE)	ND		5.0	1
7	5-34-3	1,1-Dichloroethane	1.7		1.0	1
7	8-93-3	2-Butanone (MEK)	ND		5.0	1
1	56-59-2	cis-1,2-Dichloroethylene	ND		1.0	1
6	7-66-3	Chloroform	ND		1.0	1
7	4-97-5	Bromochloromethane	ND		1.0	1
7	1-55-6	1,1,1-Trichloroethane	ND		1.0	1
10	07-06-2	1,2-Dichloroethane	ND		1.0	1
7	1-43-2	Benzene	ND	·	1.0	1
5	6-23-5	Carbon tetrachloride	ND		1.0	1
78	8-87-5	1,2-Dichloropropane	ND		1.0	1
7	9-01 <b>-</b> 6	Trichloroethylene	ND		1.0	1
74	4-95-3	Dibromomethane	ND		1.0	1
7:	5-27-4	Bromodichloromethane	ND		1.0	1
10	08-10-1	4-Methyl-2-pentanone (MlBK)	ND		5.0	1
](	0061-01-5	cis-1,3-Dichloropropene	ND		1.0	1
](	0061-02-6	trans-1,3-Dichloropropene	ND		1.0	1
10	)8-88-3	Toluene	ND		1.0	1
79	9-00-5	1,1,2-Trichloroethane	ND		1.0	1
59	91-78-6	2-Hexanone	ND		5.0	1
12	24-48-1	Dibromochloromethane	ND		1.0	1
10	06-93-4	1,2-Dibromoethane	ND		1.0	. 1

Workorder 0007251, Page 17 of 26

Printed 10/13/00 7:56 AM

Work Order #: 0007251-050N

Date Collected: 7/26/2000

PPW Test Code:

Date Extracted: 8/1/2000

by w4578 jb

Test Name:

Pesticides/PCB - Water

Date Analyzed: 8/28/2000

by BRONSONJ

Sample ID:

CP-MW-2

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
319-84-6	a-BHC	ND		0.020	1
319-85-7	ь-внс	ND		0.020	1
58-89-9	g-BHC (lindane)	ND		0.020	1
319-86-8	d-BHC	ND		0.020	1
76-44-8	Heptachlor	ND		0.020	. 1
309-00-2	Aldrin	ND		0.020	1
1024-57-3	Heptachlor epoxide	ND		0.020	1
5103-74-2	g-Chlordane	ND		0.020	1
959-98-8	Endosulfan I	ND		0.020	1
5103-71-9	a-Chlordane	ND		0.020	1
60-57-1	Dieldrin	ND		0.020	1
72-55-9	4,4'-DDE	ND		0.020	1
72-20-8	Endrin	ND		0.020	1
33213-65-9	Endosulfan II	ND		0.051	]
72-54-8	4,4'-DDD	ND		0.020	1
7421-93-4	Endrin Aldehyde	ND		0.051	1
1031-07-8	Endosulfan Sulfate	ND		0.051	1
50-29-3	4,4'-DDT	ND		0.020	1
53494-70-5	Endrin Ketone	ND		0.051	1
87-82-1	Hexabromobenzene	ND		0.020	1
72-43-5	Methoxychlor	ND		0.051	1
2385-85-5	Mirex	ND		0.020	1
59080-40-9	BP-6 (PBB)	ND		0.051	1
12674-11-2	Aroclor 1016 (PCB)	ND		0.10	1
11104-28-2	Aroclor 1221 (PCB)	ND		0.10	1
11141-16-5	Aroclor 1232 (PCB)	ND		0.10	1
53469-21-9	Aroclor 1242 (PCB)	ND		0.10	1
12672-29-6	Aroclor 1248 (PCB)	ND		0.10	1
11097-69-1	Aroclor 1254 (PCB)	ND		0.10	1
11096-82-5	Aroclor 1260 (PCB)	ND		0.10	1
37324-23-5	Aroclor 1262 (PCB)	ND		0.10	1
11100-14-4	Aroclor 1268 (PCB)	ND		0.10	1
8001-35-2	Toxaphene	ND		0.10	1
	Volume (mL)	980			

Work Order #: 0007251-05POX

Date Collected: 7/26/2000

Test Code:

WPS

Date Analyzed: 8/2/2000

by WORM

Test Name:

8260 Plus - Water

Sample ID:

CP-MW-2

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
75-71-8	Dichlorodifluoromethane	ND	·	5.0	
74-87-3	Chloromethane	ND		5.0	
75-01-4	Vinyl chloride	ND		5.0	
74-83-9	Bromomethane	ND		5.0	
75-00-3	Chloroethane	ND		5.0	
75-69-4	Trichlorofluoromethane	ND	·····	5.0	
67-64-1	Acetone	ND		25	
60-29-7	Diethyl ether	ND		10	
75-35-4	1,1-Dichloroethylene	ND		1.0	
74-88-4	Methyl iodide	ND		1.0	
107-13-1	Acrylonitrile	ND		5.0	
75-09-2	Methylene chloride	ND		5.0	
75-15-0	Carbon disulfide	ND		5.0	
156-60-5	trans-1,2-Dichloroethylene	ND		1.0	<u> </u>
1634-04-4	Methyltertbutylether (MTBE)	ND		5.0	
75-34-3	1,1-Dichloroethane	ND		1.0	
78-93-3	2-Butanone (MEK)	ND		5.0	
156-59-2	cis-1,2-Dichloroethylene	ND		1.0	
67-66-3	Chloroform	ND		1.0	
74-97-5	Bromochloromethane	ND		1.0	
71-55-6	1,1,1-Trichloroethane	ND		1.0	<del> </del>
107-06-2	1,2-Dichloroethane	ND		1.0	
71-43-2	Benzene	ND		1.0	
56-23-5	Carbon tetrachloride	ND		1.0	
78-87-5	1,2-Dichloropropane	ND		1.0	
79-01-6	Trichloroethylene	ND		1.0	<del>-</del>
74-95-3	Dibromomethane	ND	· · · · · · · · · · · · · · · · · · ·	1.0	
75-27-4	Bromodichloromethane	ND		1.0	<del></del>
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		5.0	
10061-01-5	cis-1,3-Dichloropropene	ND		1.0	
10061-02-6	trans-1,3-Dichloropropene	ND		1.0	
108-88-3	Toluene	ND		1.0	
79-00-5	1,1,2-Trichloroethane	ND		1.0	
591-78-6	2-Hexanone	ND	<del></del>	5.0	<del></del>
124-48-1	Dibromochloromethane	ND	<del>-</del>	1.0	
106-93-4	1,2-Dibromoethane	ND		1.0	

Workorder 0007251, Page 21 of 26

Printed 10/13/00 7:56 AM

Work Order #: 0007251-06ON

Date Collected: 7/26/2000

Test Code:

PPW

Date Extracted: 8/1/2000

by w4578 jb

Test Name:

Pesticides/PCB - Water

Date Analyzed: 8/24/2000

bronsonj by

Sample ID:

CP-MW-3

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
319-84-6	а-ВНС	ND		0.020	
319-85-7	ь-внс	ND		0.020	_
58-89-9	g-BHC (lindane)	ND		0.020	
319-86-8	d-BHC	ND		0.020	
76-44-8	Heptachlor	ND		0.020	
309-00-2	Aldrin	ND		0.020	
1024-57-3	Heptachlor epoxide	ND		0.020	
5103-74-2	g-Chlordane	ND		0.020	
959-98-8	Endosulfan I	ND		0.020	
5103-71-9	a-Chlordane	ND		0.020	
60-57-1	Dieldrin	ND		0.020	
72-55-9	4,4'-DDE	ND		0.020	
72-20-8	Endrin	ND		0.020	
33213-65-9	Endosulfan II	ND		0.050	
72-54-8	4,4'-DDD	ND		0.020	
7421-93-4	Endrin Aldehyde	ND		0.050	
1031-07-8	Endosulfan Sulfate	ND		0.050	
50-29-3	4,4'-DDT	ND		0.020	
53494-70-5	Endrin Ketone	ND		0.050	
87-82-1	Hexabromobenzene	ND		0.020	
72-43-5	Methoxychlor	ND		0.050	
2385-85-5	Mirex	ND		0.020	
59080-40-9	BP-6 (PBB)	ND		0.050	· . · · · · · · · · · · · · · · · · · ·
12674-11-2	Aroclor 1016 (PCB)	ND		0.10	
11104-28-2	Aroclor 1221 (PCB)	ND		0.10	
11141-16-5	Aroclor 1232 (PCB)	ND		0.10	
53469-21-9	Aroclor 1242 (PCB)	ND		0.10	
12672-29-6	Aroclor 1248 (PCB)	ND	<del> </del>	0.10	
11097-69-1	Aroclor 1254 (PCB)	ND	<del>-</del>	0.10	<del></del>
11096-82-5	Aroclor 1260 (PCB)	ND		0.10	
37324-23-5	Aroclor 1262 (PCB)	ND .	<del></del>	0.10	<del></del>
11100-14-4	Aroclor 1268 (PCB)	ND		0.10	<del> </del>
8001-35-2	Toxaphene	ND		0.10	
	Volume (mL)	1000			

Work Order #: 0007251-06POX

Date Collected: 7/26/2000

Test Code: WPS

Test Name:

8260 Plus - Water

Date Analyzed: 8/2/2000

by WORM

Sample ID:

CP-MW-3

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
75-71-8	Dichlorodifluoromethane	ND		5.0	
74-87-3	Chloromethane	ND		5.0	
75-01-4	Vinyl chloride	ND		5.0	
74-83-9	Bromomethane	ND		5.0	
75-00-3	Chloroethane	ND		5.0	
75-69-4	Trichlorofluoromethane	ND		5.0	
67-64-1	Acetone	ND		25	
60-29-7	Diethyl ether	ND		10	
75-35-4	1,1-Dichloroethylene	ND		1.0	
74-88-4	Methyl iodide	ND		1.0	
107-13-1	Acrylonitrile	ND		5.0	
75-09-2	Methylene chloride	ND		5.0	
75-15-0	Carbon disulfide	ND	-	5.0	
156-60-5	trans-1,2-Dichloroethylene	ND		1.0	
1634-04-4	Methyltertbutylether (MTBE)	ND		5.0	
75-34-3	1,1-Dichloroethane	ND		1.0	
78-93-3	2-Butanone (MEK)	ND		5.0	
156-59-2	cis-1,2-Dichloroethylene	ND		1.0	
67-66-3	Chloroform	ND		1.0	
74-97-5	Bromochloromethane	ND		1.0	
71-55-6	1,1,1-Trichloroethane	ND		1.0	
107-06-2	1,2-Dichloroethane	ND		1.0	
71-43-2	Benzene	ND		1.0	
56-23-5	Carbon tetrachloride	ND		1.0	
78-87-5	1,2-Dichloropropane	ND		1.0	
79-01-6	Trichloroethylene	ND		1.0	
74-95-3	Dibromomethane	ND		1.0	· · · · · · · · · · · · · · · · · · ·
75-27-4	Bromodichloromethane	ND		1.0	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		5.0	
10061-01-5	cis-1,3-Dichloropropene	ND		1.0	
10061-02-6	trans-1,3-Dichloropropene	ND		1.0	
108-88-3	Toluene	ND		1.0	
79-00-5	1,1,2-Trichloroethane	ND	· · · · · · · · · · · · · · · · · · ·	1.0	
591-78-6	2-Hexanone	ND	· · · · · · · · · · · · · · · · · · ·	5.0	
124-48-1	Dibromochloromethane	ND		1.0	
106-93-4	1,2-Dibromoethane	ND	<del></del>	1.0	· · · · · · · · · · · · · · · · · · ·

### MICHIGAN . DEPARTMENT OF

ENVIRONMENTAL QUALITY

## LABORATORY SERVICES SECTION DATE REV.:12/99

NO: PD-13/Ver. 2

SUBJECT: Laboratory Result Remark Codes

EFFECTIVE DATE: December1999

- A value reported is the mean of two or more determinations.
- C value calculated from other independent parameters.
- J estimated value or value not accurate.
- actual value is known to be less than the value given, i.e., substance, if present, is below detection limit.
- L actual value is known to be greater than the value given.
- T value reported is less than criteria of detection.
- w value observed is less than lowest value reportable under "T" code.
- DL sample analyzed using a dilution(s).
- DM dilution required due to matrix problems.
- HT recommended laboratory holding time was exceeded before analysis.
- LH OC indicated possible low recovery. Actual level may be higher.
- LL OC indicated possible high recovery. Actual level may be lower.
- MM analytical method or matrix is not within SOP of this laboratory.
- NC no confirmation by a second technique.
- NH non-homogeneous sample made analysis of a representative sample questionable.
- PI possible interierence may have affected the accuracy of the laboratory result.
- QC quality control problems exist.
- RB reagent blank. The level of reagent blank contamination is reported in the comment column and may be subtracted from the analyte value by the user.
- ST recommended sample collection/preservation technique not used.
- ACC laboratory accident resulted in no obtainable value.
- FCN free cyanide was not analyzed due to low level of total cyanide.
- INT interference encountered during analysis resulted in no obtainable value.
- IST improper sample collection/preservation. Sample not suitable for analysis.
- NAV requested analysis not available.
- QNS quantity not sufficient to perform requested analysis.
- STR settleable residue was not analyzed due to low suspended solids.

Approved by:

Date



# MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY ENVIRONMENTAL LABORATORY (517) 335-9800

P.O. Box 30270 Lansing, MI 48909

Report To: Environmental Response Div.

District #12

1342 SR-89 W. Ste B

Plainwell, MI 49080-1915

Attn: CAROL WEAVER

Total: \$250.00

Lab Work Order # 0008114

Work Site ID:

**CONSUMERS ENERGY** 

Matrix: Water

Client:

Received: 8/10/2000

Reported: 9/5/2000

Number of Samples: 1

COPY TO HANS JOHANNES AT MP

This is an original report:

Date:

ER\_PLAINWELL

## RECEIVED

SEP 1 1 2000

MALCOLM PIRNIE, INC. EAST LANSING, MI

CAS#	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
100-02-7	4-Nitrophenol	ND		50	
121-14-2	2,4-Dinitrotoluene	ND		5.0	
86-73-7	Fluorene	ND		1.0	
84-66-2	Diethyl phthalate	ND		1.0	
100-01-6	4-Nitroaniline	ND		20	
534-52-1	2-Methyl-4,6-dinitrophenol	ND		50	
7005-72-3	4-Chlorophenyl phenylether	ND		1.0	
156-10-5	N-Nitrosodiphenylamine	ND		2.0	
103-33-3	Azobenzene	ND		2.0	
101-55-3	4-Bromophenyl phenylether	ND		2.0	· · · · · · · · · · · · · · · · · · ·
118-74-1	Hexachlorobenzene	ND		2.0	<del></del>
87-86-5	Pentachlorophenol	ND		50	
85-01-8	Phenanthrene	ND		1.0	<del> </del>
120-12-7	Anthracene	ND		1.0	
86-74-8	Carbazole	ND		10	
84-74-2	Di-n-butyl phthalate	ND		1.0	
206-44-0	Fluoranthene	ND		1.0	
129-00-0	Рутепе	ND		1.0	
85-68-7	Butyl benzyl phthalate	ND		1.0	
56-55-3	Benz(a)anthracene	ND		1.0	
218-01-9	Chrysene	ND		1.0	
117-81-7	Bis(2-ethylhexyl)phthalate	ND		2.0	
117-84-0	Di-n-octyl phthalate	ND		2.0	
205-99-2	Benzo(b)fluoranthene	ND		2.0	
207-08-9	Benzo(k)fluoranthene	ND		2.0	
50-32-8	Benzo(a)pyrene	ND		2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	ND		2.0	
53-70-3	Dibenz(a,h)anthracene	ND		2.0	
191-24-2	Benzo(g,h,i)perylene	ND		2.0	
	Volume (mL)	1000			

ND = not detected at the specified reporting limit.

NM = not measured.

Reference method is 8270/625.

# DEâ

# MICHIGAN DEPT. OF ENVIRONMENTAL QUALITY ENVIRONMENTAL LABORATORY

# MICHIGAN DEPT. OF ENVIRONMENTAL QUALITY

ENVIRONMENTAL LABORATORY	
ANALYSIS REQUEST SHEET	

LAB ORDER	M-08-114	ANALISIS	KEQUEST 3H	EEI	MATRIX=	WATER
SUBMITTER DIVISION	DISTRICT OR OFFICE	MDEQ PR MANAGE	OJECT R & PHONE	<del></del> _		T HT CODES?
ERM	Plainvell	_		616-692-26	_	
	MPLED / SITE ID NUMBER	<u> </u>	INDEX	616-692-26	PROJECT	PH
Monsun	ers Energy.		4791		454678	
OLLECTED B		PHONE		ADDITIONAL REPORT		
d	Johannes	(517)37	4-5647	TO ATTENTION OF	Hans labor	nn. 6
	ONTRACT LAB (Required for ERD)		1 3047	AT (ADDRESS)	(If different than al	cons office)
JVERPLOW C	ON INCI END (Required for END)			1	· .	
	++ CLECTY INCODMAT	LON DECLUDED		<del>-</del>	Abbett Rd,	1
<b>*</b> *	** SAFETY INFORMAT SEE BACK O	-	***	East	Lansing, v	~I 48823
LABUSE	SEE DACK U		COLLECTED			
ONLY	SAMPLE IDENTIFICATION	DATE	COLLECTED	·	COMMENTS	[
. 0	P-mw-1	8-9-00	1520			
1 1 6	1 100 1	- 10 1 30	1 . 3 = 3		<del></del>	
2		<del></del>		<u> </u>		
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5			<del></del>	<del></del>	<del></del>	
6						
7						
8 -						
			1.			
9						
10						
	ORGANIC	GENERAL CI			INORGANI	
VOA VOI Full List	LATTLES (624/8260) 1 2 3 4 5 6 7 8 9 10	DO Diss Oxygen	1234567		il Metals 123	4 5 6 7 8 9 10 4 5 6 7 8 9 10
BTEXMTBE o		GN NO <sub>2</sub> , o-Phas	1234567		-Lab Filtered 1 2 3	
ON PES	TICIDES/PCBS	Residue SS Residue TDS	1234567	- · · · · · · · · · · · · · · · · · · ·	n Limir High	Low
	08/8081/8082)			-	NMETALS 123	
Pesticides & PC Pesticides only		BOD Tot 5 day BOD Carb 5 day	1234567	8910 (As, Ba, Cd 8910 Fe Co Lii	, Cr, Cu, Pb, Hg, Se, Aş	.Zn) 45678910
PCBs only	1 2 3 4 5 6 7 8 9 10		1234567			4 5 6 7 8 9 10
	PDES ONLY************************************	CA Chlorophyll	1234567	B Sr 8 9 10 Ni - Nickel		4 5 6 7 8 9 10 4 5 6 7 8 9 10
	SE NEUTRAL & ACIDS	· ·······		Sb - Antimo		45678910
DIA DA	(625/8270)	GA COD	1234567		•	4 5 6 7 8 9 10
BNAs	①2345678910 12345678910	TOC NO3 + NO2, NH3	1234567	_		4 5 6 7 8 9 10 4 5 6 7 8 9 10
PNAs only BNs only	1 2 3 4 5 6 7 8 9 10	KJEL N, Tot P	1234567			
A€1Ds only	1 2 3 4 5 6 7 8 9 10	<del></del>	1234567	8 9 10 MN pH, Co	onductance 1 2 3	4 5 6 7 8 9 10
Library Search (	SPECIAL REQUESTS	GG Phenolics	1234567	•	), Total Alk 123	
Volatiles	1 2 3 4 5 6 7 8 9 10	GP Phenolics (NPDES)	1234567		=	4 5 6 7 8 9 10 4 5 6 7 8 9 10
Semivolatiles	1 2 3 4 5 6 7 8 9 10	•••••				
Other	1 2 3 4 5 6 7 8 9 10	GB Total CN Amenable CN	1234567		: Greate 123	4 5 6 7 8-9 10
				· — · · · · · · · · · · · · · · · · · ·		
	ESTS RELEASED BY / AF	FILIATION	RECEIV	ED BY / AFFALIATION	, D	ATE & TIMED
n-o ody		/melcolm	1000	A Almba	المع المعرب	10 IL
Chain-of- Custody	1) XI = 1	Pirnie	Supin	1 Julian	WILL	8/10/09
	)2)	•	10	V	_	
			1			



# APPENDIX J

ENVIRONMENTAL DATA RESOURCES, INC. RADIUS MAP WITH GEOCHECK®



The EDR-Radius Map with GeoCheck®

Consumers Power North Site/MDEQ Ampersee St/Sherwood Ave Kalamazoo, MI 49001

Inquiry Number: 0559352.1r

November 16, 2000

# The Source For Environmental Risk Management Data

3530 Post Road Southport, Connecticut 06490

**Nationwide Customer Service** 

Telephone: 1-800-352-0050 Fax: 1-800-231-6802 Internet: www.edrnet.com

### **EXECUTIVE SUMMARY**

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The report meets the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. Search distances are per ASTM standard or custom distances requested by the user.

### TARGET PROPERTY INFORMATION

### **ADDRESS**

AMPERSEE ST/SHERWOOD AVE KALAMAZOO, MI 49001

#### COORDINATES

Latitude (North):

42.296600 - 42' 17' 47.8"

Longitude (West):

85.570700 - 85' 34' 14.5"

Universal Tranverse Mercator: Zone 16 UTM X (Meters):

617824.4

UTM Y (Meters):

4683483.5

### USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:

2442085-C5 KALAMAZOO, MI

Source:

USGS 7.5 min guad index

### TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

### DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ( "reasonably ascertainable ") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

### FEDERAL ASTM STANDARD

RCRIS-LQG......Resource Conservation and Recovery Information System

ERNS..... Emergency Response Notification System

### STATE ASTM STANDARD

SWF/LF..... Solid Waste Facilities Database

### FEDERAL ASTM SUPPLEMENTAL

CONSENT......CONSENT

FINDS.......Facility Index System/Facility Identification Initiative Program Summary Report

HMIRS..... Hazardous Materials Information Reporting System

MLTS..... Material Licensing Tracking System

MINES..... Mines Master Index File

NPL Lien\_\_\_\_\_ NPL Liens

### **EXECUTIVE SUMMARY**

CERCLIS-NFRAP: As of February 1995. CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund Action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

A review of the CERC-NFRAP list, as provided by EDR, and dated 04/16/2000 has revealed that there is 1 CERC-NFRAP site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
PORTAGE CREEK	PORTAGE CRK WITHIN CITY	1/8 - 1/4 SW	D12	15

CORRACTS: CORRACTS is a list of handlers with RCRA Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity.

A review of the CORRACTS list, as provided by EDR, and dated 04/20/2000 has revealed that there is 1 CORRACTS site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
SUN CHEMICAL CORP-GPI DIV	1807 N PITCHER STREET	1/2 - 1 NNV	/ 40	<i>35</i>

RCRIS: The Resource Conservation and Recovery Act database includes selected information on sites that generate, store, treat, or dispose of hazardous waste as defined by the Act. The source of this database is the U.S. EPA.

A review of the RCRIS-SQG list, as provided by EDR, and dated 06/21/2000 has revealed that there are 9 RCRIS-SQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
AUTO ION SITE	74 MILLS ST	1/8 - 1/4 SE	0	5
ALLIED PAPER/PORTAGE CK/KALAMA	511 EAST PATERSON STREE	0 - 1/8 WNW	0	7
LYON MACHINE BUILDERS	904 HOTOP	0 - 1/8 NNW	A1	9
PRECISION HEAT TREATING CO INC	660 GULL RD	1/8 - 1/4 NW	3	10
CARRIAGE CLEANERS RIVERVIEW	803 RIVERVIEW DR	1/8 - 1/4 NNE	B7	13
MAACO AUTO PAINTING	108 PARKWAY DR	1/8 - 1/4 SSW	10	14
MIDOT BRIDGE I-94 OVER PORTAGE	I-94 OVER PORTAGE CREEK	1/8 - 1/4 SW	D11	15
KTS INDUSTRIES INC	508 HARRISON ST	1/8 - 1/4 WSW	C13	15
S AND R TOOL AND DIE CO INC	424 HARRISON ST	1/8 - 1/4 SW	F16	17

### STATE ASTM STANDARD

SHWS: The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Department of Environmental Quality's' Contaminated Sites List on Diskette With Address.

A review of the SHWS list, as provided by EDR, has revealed that there are 13 SHWS sites within approximately 1 mile of the target property.

### **EXECUTIVE SUMMARY**

### FEDERAL ASTM SUPPLEMENTAL

RODS: Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid the cleanup.

A review of the ROD list, as provided by EDR, has revealed that there is 1 ROD site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
AUTO ION SITE	74 MILLS ST	1/8 - 1/4 SE	0	5

### PROPRIETARY DATABASES

### Former Manufactured Gas (Coal Gas) Sites:

The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative

A review of the Coal Gas list, as provided by EDR, has revealed that there is 1 Coal Gas site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
KALAMAZOO GAS LIGHT CO.	300-360 S. PITCHER	1/2 - 1 SW	32	31

OVERVIEW MAP - 0559352.1r - Malcolm Pirnle, Inc. ₩ ₩ HIVERVIEW PARE -= 780 # 6T HUMPHREY **6** T о Х 4 87 \* 0 K WAL NUT 14 1/2 **Target Property** 1 Miles Sites at elevations higher than or equal to the target property Sites at elevations lower than the target property Oil & Gas pipelines Coal Gasification Sites (if requested) National Priority List Sites Landfill Sites KR059B027397

TARGET PROPERTY: ADDRESS: TY/STATE/ZIP:

AT/LONG:

Consumers Power North Site/MDEQ Ampersee St/Sherwood Ave Kalamazoo MI 49001 42.2966 / 85.5707 CUSTOMER: CONTACT: INQUIRY #: DATE: Malcolm Pirnie, Inc. Hans A. Johannes 0559352.1r

0559352.1r November 16, 2000, 5:31 pm 01454

# MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL ASTM STANDAR	<u>.D</u>							
NPL Delisted NPL CERCLIS CERC-NFRAP CORRACTS	•••	1.000 1.000 0.500 0.250 1.000	1 0 1 0	1 0 1 1	0 0 0 NR 0	0 0 NR NR	NR NR NR NR	2 0 2 1
RCRIS-TSD RCRIS Lg. Quan. Gen. RCRIS Sm. Quan. Gen. ERNS	÷	0.500 0.250 0.250 TP	0 0 2 NR	0 0 7 NR	0 NR NR NR	1 NR NR NR NR	NR NR NR NR NR	1 0 0 9 0
STATE ASTM STANDARD								
State Haz. Waste State Landfill LUST UST		1.000 0.500 0.500 0.250	1 0 0 0	1 0 3 5	3 0 12 NR	8 NR NR NR	NR NR NR NR	13 0 15 5
FEDERAL ASTM SUPPLEME	NTAL							
CONSENT ROD FINDS HMIRS MLTS MINES NPL Liens PADS RAATS TRIS TSCA		1.000 1.000 TP TP TP 0.250 TP TP TP TP	0 0 R R R R R R R R R R R R R R	0 1 NR NR NR 0 NR NR NR NR NR NR NR NR NR NR NR NR NR	0 0 R R R R R R R R R R R R R R R R R R	0 0 R R R R R R R R R R R R R R R R R R	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	0 1 0 0 0 0 0 0
STATE OR LOCAL ASTM SU	PPLEMENTAL							
AST EDR PROPRIETARY DATABA	SES	TP	NR	NR	NR	NR	NR	0
Coal Gas AQUIFLOW - see EDR Phys	Eical Sattina S	1.000	0	0	0	1	NR	1

TP = Target Property

NR = Not Requested at this Search Distance

<sup>\*</sup> Sites may be listed in more than one database

### MAP FINDINGS

Map ID
Direction
Distance
Distance (fl.)
Elevation Site

Database(s)

EDR ID Number EPA ID Number

### **AUTO ION SITE (Continued)**

1000865869

Assessment:	SECTION 107 LITIGATION	Completed:	19920407
Assessment:	REMOVAL ASSESSMENT	Completed:	19920619
Assessment:	PRP RD	Completed:	19930316
Assessment:	MANAGEMENT ASSISTANCE	Completed:	19940630
Assessment:	PRP RA	Completed:	19940803
Assessment:	PRP RI/FS	Completed:	19940923
Assessment:	RECORD OF DECISION	Completed:	19940923
Assessment:	RD/RA NEGOTIATIONS	Completed:	19960926
Assessment:	Lodged By DOJ	Completed:	19961121
Assessment:	CONSENT DECREE	Completed:	19970312
Assessment:	PRP COMMUNITY INVOLVEMENT	Completed:	19980904

CERCLIS Site Status:

Not reported

CERCLIS Alias Name(s):

AUTO ION CHEMICALS INC AUTO ION CHEMICALS INC AUTO ION CHEMICALS INC AUTO ION CHEMICALS, INC

NPL:

 ID:
 05MI005

 Date Listed:
 9/08/83 (FINAL)

 EPA/ID:
 MID980794382

 Haz. Rank Score:
 32.07

Haz. Rank Score: 32.07
Status: LISTED ON NPL

Rank: 878
Group: 18
Ownership: State

Permit: Not reported
Site Activities: Surface Impoundment
Site Activities: Electroplating
Site Activities: Containers/Drums

Site Activities:

Site Condition: Damage of Flora/Fauna Site Condition: Contamination of Soil

Waste Type: Metals

Contaminant: Media Affected: CYANIDES (SOLUBLE SALTS), NOS Surface Water CHROMIUM, HEXAVALENT Surface Water NICKEL CHLORIDE Surface Water

Distance to nearest Population:

Population within a 1 Mile Radius:

Population within a 2 Mile Radius:

Population within a 4 Mile Radius:

Vertical Distance to Aquifer:

Not reported

Not reported

Not reported

21 Feet to 75 Feet

Ground Water Use: Used as Drinking Water, Alternative Source not Available

Spill

Distance to nearest Suriace Water: Not reported

ROD

Full-text of USEPA Record of Decision(s) is available from EDR.

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

Database(s)

EDR ID Number EPA ID Number

## ALLIED PAPER/PORTAGE CK/KALAMAZOO RIVER (Continued)

1000248884

portion of this site due to the PCB contamination. In August 1990, the site was officially placed on the National Priorities List (NPL). There are four Potentially Responsible Parties (PRPs) for the PCB contamination of this site. They are HM Holdings, Inc./Allied Paper, Inc., Georgia-Pacific Corporation, Simpson Plainwell Paper Company, and James River Corpor ation. A Record of Decision was issued in February 1998 that addressed the four Cells of the KHL, PCB-contaminated sediments, soils, and residuals located on the berms, in the KSSS floodplain, in the Kalamazoo River directly adjacent to the KHL, and in the five former lagoons at Georgia-Pacific Corporation.

#### **CERCLIS Assessment History:**

DISCOVERY	Completed:	19790401
PRELIMINARY ASSESSMENT	Completed:	19851108
PROPOSAL TO NPL	Completed:	19890505
SITE INSPECTION	Completed:	19890505
REMOVAL ASSESSMENT	Completed:	19890720
FINAL LISTING ON NPL	Completed:	19900830
ADMIN ORDER ON CONSENT	Completed:	19901101
STATE ORDER	Completed:	19901228
PRP REMOVAL	Completed:	19910717
REMOVAL ASSESSMENT	Completed:	19920511
HUMAN HEALTH RISK ASSESSMENT	Completed:	19940805
NPL RP SEARCH	Completed:	19950929
ADMIN ORDER ON CONSENT	Completed:	19980123
PRP RI/FS	Completed:	19980210
RECORD OF DECISION	Completed:	19980210
PRP REMOVAL	Completed:	19991022
	PRELIMINARY ASSESSMENT PROPOSAL TO NPL SITE INSPECTION REMOVAL ASSESSMENT FINAL LISTING ON NPL ADMIN ORDER ON CONSENT STATE ORDER PRP REMOVAL REMOVAL ASSESSMENT HUMAN HEALTH RISK ASSESSMENT NPL RP SEARCH ADMIN ORDER ON CONSENT PRP RIFS RECORD OF DECISION	PRELIMINARY ASSESSMENT PROPOSAL TO NPL SITE INSPECTION Completed:

CERCLIS Site Status:

Partially Cleaned up

CERCLIS Alias Name(s):

ALLIED PAPER

PORTAGE CREEK

ALLIED CORP KALAMAZOO PLT

ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIV

ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIV

Map ID Direction Distance Distance (ft.) Elevation Site MAP FINDINGS

Database(s)

SHWS

RCRIS-SQG

**FINDS** 

TRIS

UST

EDR ID Number **EPA ID Number** 

LYON MACHINE BUILDERS (Continued)

1000305544

S103595251

1000172116

MID990858292

N/A

RCRIS:

Owner:

SMITH WAYNE

(312) 555-1212

Contact:

JOHN JACKSON

(616) 349-7634

Record Date:

10/02/1986

Classification:

Small Quantity Generator

Used Oil Recyc: No

Violation Status: No violations found

A2 NNW < 1/8 441

LYONS MACHINE BUILDERS

904-910 HOTOP

KALAMAZOO, MI

Higher

SHWS:

Facility ID:

390382

Facility Status: Source:

Eval/Interim Resp-PRP/Oth **Fabricated Metal Products** 

Pollutant(s):

BTEX, PNA's, Metals

SAM Score:

SAM Score Date:

8/31/94 0:00:00 025

37

11W

14

В

Township:

Range: Section:

Quarter.

Quarter/Quarter:

Change:

New Addition to List 9/22/94 0:00:00

Change Date:

County Code:

39

NW 1/8-1/4 739 Higher PRECISION HEAT TREATING CO INC

660 GULL RD

KALAMAZOO, MI 49007

RCRIS:

Owner.

JUZWIAK MARY JEANNE

(616) 382-4660

Contact:

**DONALD JUZWIAK** 

(616) 382-4660

Record Date:

04/03/1997

Classification:

Not reported

Map ID Direction Distance Distance (ft.) Elevation Site

Database(s)

SHWS

**EDR ID Number EPA ID Number** 

## INDIAN TRAILS INC (Continued)

U000256241

Owner: Owner Address:

INDIAN TRAILS INC 109 E COMSTOCK

OWOSSO, MI 48867

Product: Capacity: Diesel 7.500

25 Tank Age: Tank Material: Bare Steel Tank Status: Remv

**Galvanized Steel** Piping Material: Piping Type:

Not reported KENNETH W HENRY

Contact: Contact Phone: (517) 725-5105

Release Detection:

Tank: Pipe:

Not reported

Facility ID:

Not reported

Tank ID:

Capacity:

0-000021

Owner:

INDIAN TRAILS INC

Owner Address:

109 E COMSTOCK **OWOSSO, MI 48867** 

Product:

Diesel 10,000

Tank Age: Tank Material: Tank Status:

10 Fiberglass Сип

Piping Material: Piping Type:

Fiberglass Suction - No Valve

Contact:

**KENNETH W HENRY** (517) 725-5105

Contact Phone: Release Detection:

Tank:

**Inventory Control** 

Pipe:

Groundwater Mon

South 1/8-1/4 849 Higher CONSUMERS ENERGY (FORMER) **701 EAST MICHIGAN AVENUE** 

KALAMAZOO, MI 49007

SHWS:

Facility ID:

390427

Facility Status:

Eval/Interim Resp-PRP/Oth

Source: Pollutant(s): **Electrical Services** 

Arsenic, PCB, Benzo (a) pyrene

SAM Score: SAM Score Date:

11/5/98 0:00:00

Township:

025

Range:

11W

Section:

15

Quarter:

Α

Quarter/Quarter:

Change:

New to List 5/28/99 0:00:00

Change Date:

County Code:

39

S103595296

N/A

SSW

1/8-1/4 1065 Higher **108 PARKWAY DR** 

KALAMAZOO, MI 49007

MID98560525

**FINDS** 

Map ID Direction Distance Distance (ft.) Elevation Site

#### MAP FINDINGS

Database(s)

**EDR ID Number EPA ID Number** 

## KTSINDUSTRIESINC (Continued)

1000130676

RCRIS:

Owner:

KTS INDUSTRIES INC

(616) 345-7155

Contact:

**RAY THOMPSON** 

(616) 345-2141

Record Date:

08/18/1980

Classification:

Small Quantity Generator

Used Oil Recyc: No

Violation Status: Violations exist

Regulation Violated:

Not reported

Area of Violation:

Generator-All Requirements 09/29/1988

Date Violation Determined:

Low

Priority of Violation: Schedule Date to Achieve Compliance:

11/11/1988

**Actual Date Achieved Compliance:** 

05/08/1989

**Enforcement Action: Enforcement Action Date:**  Written Informal 10/10/1988

Proposed Monetary Penalty:

Not reported

Final Monetary Penalty:

Not reported

There are 1 violation record(s) reported at this site:

**Evaluation** 

Area of Violation

Date of Compliance

Compliance Evaluation Inspection (CEI)

Generator-All Requirements

05/08/1989

Other Pertinent Environmental Activity Identified at Site: Permit Compliance System (PCS)

E14 NNE 1/8-1/4 1174 Higher **MCDONALDS RESTAURANT** 908 RIVERVIEW DR

KALAMAZOO, MI 49001

UST

U000715489 N/A

UST:

Facility ID:

0-035887

Tank ID:

Owner:

MCDONALDS CORP

Owner Address:

5920 TAHOE DR SE **GRAND RAPIDS, MI 49546** 

Product:

Gasoline

Capacity:

500

Tank Age:

29

Tank Material:

Unknown

Tank Status:

Remv

Piping Material:

Unknown

Piping Type:

**Gravity Fed** 

Contact:

**IVAN CUPPETT** 

Contact Phone:

(616) 942-7340

Release Detection:

Tank:

Not reported

Pipe:

Not reported

Map ID Direction Distance Distance (ft.) Elevation Site

Database(s)

EDR ID Number **EPA ID Number** 

## TOTAL #4279 (Continued)

U000256608

Facility ID:

Tank ID:

2

Owner:

TPI PETROLEUM INC (TOTAL)

Owner Address:

28001 CITRIN DR **ROMULUS, MI 48174** 

Product: Capacity:

10,000 28

Tank Age: Tank Material:

Bare Steel Remv

Gasoline

0-009437

Tank Status: Piping Material:

Galvanized Steel

Piping Type:

Not reported

Contact:

**GERALD A STAUFFER** 

Contact Phone:

(313) 946-5500

Release Detection:

Tank:

Not reported

Pipe:

Not reported

Facility ID:

0-009437 3

Tank ID: Owner:

TPI PETROLEUM INC (TOTAL)

Owner Address:

28001 CITRIN DR

**ROMULUS, MI 48174** 

Product:

Gasoline

Capacity:

10,000

Tank Age:

28

Tank Material:

**Bare Steel** 

Tank Status:

Remy **Galvanized Steel** 

Piping Material: Piping Type:

Not reported

Contact:

**GERALD A STAUFFER** 

Contact Phone:

(313) 946-5500

Release Detection:

Tank:

Not reported

Pipe:

Not reported

Facility ID:

0-009437

Tank ID: Owner:

TPI PETROLEUM INC (TOTAL) 28001 CITRIN DR

Owner Address:

**ROMULUS, MI 48174** 

Product:

Gasoline 6.000

Capacity:

23

Tank Age:

Tank Material:

**Bare Steel** Remv

Tank Status: Piping Material:

**Galvanized Steel** 

Piping Type:

Not reported

(313) 946-5500

Contact:

**GERALD A STAUFFER** 

Contact Phone:

Release Detection:

Not reported

Tank: Pipe:

Not reported

Facility ID:

Tank ID:

0-009437

Map ID Direction Distance Distance (ft.) Elevation

Database(s)

**EDR ID Number EPA ID Number** 

## BAHR OIL CO. (Continued)

U000256570

LUST:

Facility ID:

0-005188

Facility Status:

**OPEN** 

Region:

STATE

UST:

Facility ID:

0-005188

Tank ID:

Owner:

MRS ADOLPH BAHR 5785 N'WESTNEDGE

Owner Address:

KALAMAZOO, MI 49004

Product:

Gasoline 4.200

Capacity:

Tank Age:

31

Tank Material:

**Bare Steet** 

Tank Status:

Remv

Piping Material:

**Galvanized Steel** 

Piping Type:

Suction - Valve

Contact:

**ELEANOR BAHR** 

Contact Phone:

(616) 345-6484

Release Detection:

Tank:

Manual Gauging

Pipe:

Not reported

Facility ID:

0-005188

Tank ID: Owner:

MRS ADOLPH BAHR

Owner Address:

**5785 N WESTNEDGE** 

KALAMAZOO, MI 49004

Product: Capacity: Gasoline 4,200

Tank Age:

31

Tank Material:

Bare Steel

Tank Status:

Remv

Piping Material:

Galvanized Steel

Piping Type:

Suction - Valve

Contact:

**ELEANOR BAHR** 

Contact Phone:

(616) 345-6484

Release Detection:

Tank:

Manual Gauging

Pipe:

Not reported

Facility ID:

0-005188

Tank ID:

Owner:

MRS ADOLPH BAHR

Owner Address:

5785 N WESTNEDGE KALAMAZOO, MI 49004

Product:

Diesel

Capacity:

4,000

Tank Age:

31

Tank Material:

Bare Steel

Tank Status:

Remv

Piping Material:

Galvanized Steel

Piping Type:

Suction - Valve

Contact: Contact Phone:

**ELEANOR BAHR** (616) 345-6484

Release Detection:

Map ID Direction Distance Distance (ft.) MAP FINDINGS

Database(s)

UST

LUST

LUST

EDR ID Number **EPA ID Number** 

#### AUTO ION CHEMICALS, INC (Continued)

S103085982

U003426310

N/A

SHWS:

Site

Facility ID:

390005

Facility Status:

Final Cleanup - PRP/Other

Source:

Plating polishing

Pollutant(s):

Cyanide, Chromium

SAM Score:

36

SAM Score Date:

12/3/90 0:00:00 02S

Township:

11W

Range:

14

Section:

Quarter: Quarter/Quarter: C Α

Change:

Rescored from 0246 to 36

Change Date:

9/19/91 0:00:00

County Code:

39

G20 WSW 1/4-1/2 1657 Higher

Elevation

539 E MICHIGAN AVE

VACANT LAND

KALAMAZOO, MI 49007

LUST:

Facility ID:

0-039702

Facility Status:

**OPEN** 

Region:

STATE

UST:

Facility ID:

0-039702

Tank ID: Owner:

DOWNTOWN TOMORROWN INC

Owner Address:

157 S KALAMAZOO MALL ST KALAMAZOO, MI 49007

WASTE/OIL

Product: Capacity:

500

Tank Age:

Tank Material:

Unk Bare Steel

Tank Status:

Remv

Piping Material:

Unknown

Piping Type:

Not reported

Contact:

**ANDY MILLER** 

Contact Phone:

(616) 344-0795

Release Detection:

Tank:

Not reported

Pipe:

Not reported

G21 WSW 1/4-1/2 1718

FIRST OF AMERICA

513-517 E KALAMAZOO AVE

KALAMAZOO, MI

Higher

LUST:

Facility ID:

5-000047

Facility Status:

**OPEN** 

Region:

STATE

S102353445

N/A

Map ID Direction Distance Distance (ft.) Elevation Site

Database(s)

UST

LUST

**EDR ID Number EPA ID Number** 

## E.M SERGEANT CO (Continued)

U002301667

Release Detection:

Tank:

Not reported

Pipe:

Not reported

Facility ID:

0-013095

Tank ID:

Owner:

E.M SERGEANT CO PO BOX 50191

Owner Address: KALAMAZOO, MI 49007

Product:

Diesel 10,000

Capacity:

Tank Age:

52

Tank Material:

Bare Steel

Tank Status:

Remv

Piping Material:

**Bare Steel** 

Not reported

Piping Type:

JAMES WOODRUFF

Contact: Contact Phone:

(616) 343-1363

Release Detection:

Tank:

Not reported

Pipe:

Not reported

Facility ID:

Tank ID:

0-013095 **GAS** 

Owner:

E.M SERGEANT CO

Owner Address:

PO BOX 50191 KALAMAZOO, MI 49007

Product:

Gasoline

Capacity: Tank Age: 6.000 42

Tank Material:

Bare Steel

Tank Status:

Remy

Piping Material:

**Bare Steel** 

Piping Type:

Not reported

(616) 343-1363

Contact:

JAMES WOODRUFF

Contact Phone:

Release Detection:

Tank:

Not reported

Pipe:

Not reported

23 WSW 1/4-1/2 1843 Higher DON NEALS BANQUET CENTER

521 E MICHIGAN AVE

KALAMAZOO, MI 49007

LUST:

Facility (D:

0-039847

Facility Status: Region:

**OPEN** STATE

UST:

Facility ID:

Tank ID:

0-039847

Owner:

MICHIGAN HOME DIALYSIS CENTER

Owner Address:

2845 CAPITAL AVE

Product:

BATTLE CREEK, MI 49015

Capacity:

Gasoline 12,000

U003426423

N/A

Map ID Direction Distance Distance (ft.) Site Elevation

Database(s)

EDR ID Number **EPA ID Number** 

U003330511

U002301608

N/A

## **HANSON DIST CO (Continued)**

UST

LUST

Facility ID:

0-005157

Tank ID:

Owner:

FRED OLM

Owner Address: PO BOX 50747

KALAMAZOO, MI 49005

Product: Capacity: Gasoline 500

Tank Age:

23

Tank Material:

Bare Steel

Tank Status:

Remv

Piping Material: Piping Type:

Galvanized Steel Not reported

Contact:

HANSON DIST CO

(616) 382-2814

Contact Phone:

Release Detection:

Tank: Pipe:

Not reported Not reported

25 North 1/4-1/2 1989 Higher

**UNITED #6262** 1123 RIVERVIEW DR KALAMAZOO, MI 49001

LUST:

Facility ID:

0-011833

Facility Status:

**CLOSED** 

Region:

STATE

UST:

0-011833 Facility ID:

Tank ID: Owner:

**EMRO MARKETING CO** 

Owner Address: PO BOX 1500

SPRINGFIELD, OH 45501

Product: Capacity:

6,000

Tank Age:

31

Tank Material:

Bare Steel Remv

Gasoline

Tank Status: Piping Material:

**Galvanized Steel** 

Piping Type:

Not reported **R G SCHUMANN** 

Contact:

Contact Phone: (708) 335-0600

Release Detection:

Tank: Pipe:

Manual Gauging Leak Detector

Facility ID:

0-011833

Tank ID:

Owner:

**EMRO MARKETING CO** 

Owner Address:

PO BOX 1500 SPRINGFIELD, OH 45501

Product:

Gasoline

Capacity:

8,000

Tank Age:

31

Tank Material:

Tank Status:

Bare Steel Remy

Piping Material:

Galvanized Steel

Map ID Direction Distance Distance (ft.) Elevation

Site

Database(s)

EDR ID Number **EPA ID Number** 

## UNITED #6262 (Continued)

U002301608

Release Detection:

Tank:

Manual Gauging

Pipe.

Leak Detector

Facility ID:

0-011833

Tank ID:

Owner:

**EMRO MARKETING CO** 

Owner Address: PO BOX 1500

SPRINGFIELD, OH 45501

Product:

Gasoline 6.000

Capacity:

Tank Age:

31

Tank Material:

Bare Steel

Tank Status:

Remv

Piping Material:

Galvanized Steel

Piping Type:

Suction -- No Valve

Contact:

R G SCHUMANN

Contact Phone:

(708) 335-0600

Release Detection:

Tank:

Manual Gauging

Pipe:

Leak Detector

Facility ID:

0-011833

Tank ID: Owner:

**EMRO MARKETING CO** 

Owner Address:

**PO BOX 1500** SPRINGFIELD, OH 45501

Product:

Used Oil

Capacity: Tank Age:

550 31

Tank Material:

Bare Steel

Tank Status: Piping Material:

Remv Galvanized Steel

Piping Type:

Not reported

Contact:

**R G SCHUMANN** 

Contact Phone: (708) 335-0600 Release Detection:

Tank:

Not reported

Pipe:

Not reported

26 West 1/4-1/2 2044 Higher ADAMS OUTDOOR ADVERTISING

407 E RANSOM ST

KALAMAZOO, MI 49007

LUST:

Facility ID:

0-021018

Facility Status:

CLOSED

Region:

STATE

UST:

Facility ID:

0-021018

Tank ID:

ADAMS OUTDOOR ADVERTISING

Owner:

Owner Address: 407 E RANSON ST

KALAMAZOO, MI 48907

Product:

Gasoline

2,000 Capacity:

KR059B027410

LUST

UST

1001006987

N/A

Map ID Direction Distance Distance (ft.) Elevation Site

Database(s)

**EDR ID Number EPA ID Number** 

## K M LAWN SERVICE (Continued)

U000256288

LUST:

Facility ID: 0-004577 Facility Status: CLOSED Region: STATE

UST:

Facility ID:

0-004577

Tank ID:

Owner:

PETER SARANTOS Owner Address: **6810 MANHATTAN** 

KALAMAZOO, MI 49002

Product:

Gasoline 1,000

Capacity:

18

Tank Age: Tank Material:

Bare Steel Remv

Tank Status:

Piping Material:

Galvanized Steel

Piping Type:

Not reported

Contact:

PETER SARANTOS

Contact Phone:

(616) 323-2463

Release Detection:

Tank:

Not reported

Pipe:

Not reported

29 SW 1/4-1/2 2406 Higher **J&K FURNITURE STORE 427 E MICHIGAN AVE** KALAMAZOO, MI 49007

UST LUST U003426360

N/A

LUST:

Facility ID:

0-039767

Facility Status:

OPEN

Region:

STATE

UST:

Facility ID: 0-039767

Tank ID:

Owner: FREDERICK ROYCE III

Owner Address:

100 MONROE ST KALAMAZOO, MI 49006

Product:

UNK 2,000

Capacity: Tank Age:

Unk

Tank Material:

Bare Steel

Tank Status:

Remy Bare Steel

Piping Material:

Piping Type: Contact:

Suction - No Valve

Contact Phone:

MARK S KIESER (616) 344-7117

Release Detection:

Tank:

Not reported

Pipe:

Not reported

30 South 1/4-1/2 2453

Higher

**DOUGLAS BYAM/KENNETH RODARMER** 

915 GIBSON ST

KALAMAZOO, MI 49001

LUST UST

1001117597

N/A

Map ID Direction Distance Distance (ft.)

Elevation Site

Database(s)

SHWS

EDR ID Number **EPA ID Number** 

S103095344

N/A

33 NW

Higher

PITCHER AND PATTERSON STS 243 EAST PATERSON STREET

1/2-1 3374

KALAMAZOO, MI 49007

SHWS:

Facility ID:

390266

Facility Status:

Eval/Interim Resp-PRP/Oth Paper and Affied Products

Source: Pollutant(s):

Arsenic Chromium DCE, Lead Toluene

SAM Score: SAM Score Date:

34 9/28/91 0:00:00

Township: Range: Section:

025 11W 10

Quarter: Quarter/Quarter:

D

Change:

Name Change from James

Change Date:

3/17/92 0:00:00

County Code:

39

34 ENE 1/2-1 3719 Higher WASTE OIL STORAGE HAZARD STREET

937 HAZARD ST

KALAMAZOO, MI 49001

CERC-NFRAP 1000397474 SHWS MID981528227

LUST

**CERCLIS-NFRAP Classification Data:** 

Site Incident Category: Not reported Ownership Status: Other

**CERCLIS-NFRAP Assessment History:** 

Assessment: DISCOVERY

Assessment:

PRELIMINARY ASSESSMENT

Assessment:

PRELIMINARY ASSESSMENT

Methylene chloride, TCA DCA TCE

Completed: Completed:

**NPL Status:** 

19860730

Federal Facility: Not a Federal Facility

Completed:

19861028 19900309

Not on the NPL

SHWS:

Facility ID:

390050

**Facility Status:** 

Eval/Interim Resp - Funds

Source:

Oil solvent recycle

Pollutant(s): SAM Score:

24

SAM Score Date: Township:

11/27/90 0:00:00 025

Range:

11W

Section:

14

Quarter:

Α

Quarter/Quarter: Change:

Rescored from 0280 to 24

Change Date:

9/19/91 0:00:00

County Code:

39

LUST:

Facility ID:

5-001698

**Facility Status:** Region:

**OPEN** 

STATE

35 ESE MCLEIEER OIL BULK PLANT 1718 EAST MICHIGAN AVENUE

1/2-1

3862 Higher KALAMAZOO, MI 49001

SHWS

S103595248 N/A

Map ID Direction Distance Distance (ft.) MAP FINDINGS

Database(s)

EDR ID Number **EPA ID Number** 

SINCLAIR BULK STOR AMER AGGREG (Continued)

S103595249

S103595235

N/A

SHWS:

Site

Facility ID:

390267

Facility Status:

Eval/Interim Resp-PRP/Oth Petroleum Bulk Stations & Term

Source: Pollutant(s):

BTEX

SAM Score:

32

SAM Score Date:

9/28/91 0:00:00

Township:

028 11W

Range:

Section:

23

Quarter:

В

Quarter/Quarter:

В New Addition to List

Change: Change Date:

8/26/92 0:00:00

County Code:

39

38 SSE

Elevation

WASTE OIL STORAGE CROSSTOWN PKWY

1326 E CROSSTOWN PKWY 1/2-1 KALAMAZOO, MI 49008

4232 Higher

SHWS:

Facility ID:

390049

Facility Status:

Eval/Interim Resp - Funds

Source:

Nonclassifiable Establishments

Pollutant(s):

Chloroform, TCE 1,1,1-TCA, 1,1-DCA

SAM Score:

SAM Score Date:

Township:

1/16/91 0:00:00 025

Range:

11W

Section:

23

Quarter:

В A

Quarter/Quarter: Change:

Rescored from 38 to 36

Change Date:

11/4/98 0:00:00

County Code:

39 NNW 1/2-1

4251 Higher PITCHER AND PROUTY ST. PITCHER AND PROUTY ST. AREA

KALAMAZOO, MI

SHWS

SHWS

S103095362

N/A

## ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Dalabase(s)	Facility ID
COOPER	S100069686	OLD COOPER TOWNSHIP	OFF "E" AVE	49007	SWF/LF	39000028
KALAMAZOO	90173104	US 131 NORTH	US 131 NORTH		ERNS	
KALAMAZOO	S103095347	A P E C AMPERSEE ST LOTS	430, 434, 502 AMPERSEE STREET	49001	SHWS	390269
KALAMAZOO	S103595252	EAST WILLARD	501 / 521 E. WILLARD & 500 E. RANSOM STS		SHWS	390426
KALAMAZOO	S103595226	KALAMAZOO MUN WELLS CENTRAL NO 1	COR OFF STOCKBRIDGE / CROSSTWN	49001	SHWS	390019
KALAMAZOO	S103595225	GULL ROAD SITE RIVERVIEW DRIVE	GULL ROAD AND RIVERSIDE DRIVE		SHWS	390016
KALAMAZOO	1001488183	GULL ROAD AUTOMOTIVE CO	5242 GULL RD	49001	RCRIS-SQG, FINDS	
KALAMAZOO	S100069674	WEST K L AVE SLF	8606 W KALAMAZOO AVE	49007	SWF/LF	39000014
KALAMAZOO	S103595231	RES WELLS LAKERIDGE RD	7215 LAKERIDGE RD	49001	SHWS	390038
KALAMAZOO	S103086056	NEWPORT RD & EAST MILHAM RD	MILHAM ROAD	49001	SHWS	390101
KALAMAZOO	1002944393	CONSUMERS CONCRETE CORP	NAZARETH RD	49001	FINDS	
KALAMAZOO	S103086018	PRODUCTION PAINTING CO	1002 O'WEIL ST	49001	SHWS	390071
KALAMAZOO	S100344451	KALAMAZOO CITY-RAVINE RD	OFF RAVINE RD	49007	SWF/LF	39000022
KALAMAZOO	S100344450	KALAMAZOO CITY (RIVERSIDE GULF)	OFF KING HWY	49001	SWF/LF	39000026
KALAMAZOO	S103595227	KALAMAZOO NO 14 WELLS CITY OF	MT OLIVE / GULL ST	49004	SHWS	390021
KALAMAZOO	S103595224	FARM BUREAU SVCS FERTILIZER SITE	OLMSTED ROAD		SHWS	390013
KALAMAZOO	1000529568	PATERSON ST BRIDGE	PATERSON ST BRIDGE OVER KALAMA	49007	RCRIS-SQG, FINDS	
KALAMAZOO	1001817552	CONSUMERS ENERGY	PITCHER ST	49001	FINDS, RCRIS-LQG	
KALAMAZOO	S103595236	PORTAGE CREEK KALAMAZOO RIVER	PORTAGE CRK WITHIN CITY LIMITS		SHWS	390051
KALAMAZOO	S103595242	ARCADIA CREEK CORRIDOR	ROSE AND ELEANOR ST. AREA		SHWS	390093
KALAMAZOO	S103595304	SCHIPPERS CROSSING	SCHIPPERS LANE		SHWS	390430
KALAMAZOO	S103595234	SPRING ST DOWNTOWN KALAMAZOO	SPRING STREET		SHWS	390044
KALAMAZOO	S100070364	KAV COMPANY SLF	M-89 TO DOSTER, EAST ON OAK		SWF/LF	08000009
KALAMAZOO COUNTY	S103095356	Q AVE-CROOKED LAKE	Q-AVE		SHWS	390257
PARCHMENT	S100069679	CITY OF PARCHMENT DISP AREA	COMMERCE LANE	49004	SWF/LF	39000019
PARCHMENT		CROWN PAPER COMPANY	LOTTIE DRIVE	49004	SWF/LF	39-000037
PORTAGE		LOVERS LANE	LOVERS LANE / BISHOP RD	49001	SHWS	390067

# **GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING**

CORRACTS: Corrective Action Report

Source: EPA

Telephone: 800-424-9346

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 04/20/00 Date Made Active at EDR: 08/01/00

Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 06/12/00

Elapsed ASTM days: 50

Date of Last EDR Contact: 09/12/00

RCRIS: Resource Conservation and Recovery Information System

Source: EPAINTIS Telephone: 800-424-9346

Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate.

transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery

Act (RCRA).

Date of Government Version: 06/21/00 Date Made Active at EDR: 07/31/00 Database Release Frequency: Semi-Annually Date of Data Arrival at EDR: 07/10/00

Elapsed ASTM davs: 21

Date of Last EDR Contact: 11/09/00

**ERNS: Emergency Response Notification System** 

Source: EPA/NTIS Telephone: 202-260-2342

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous

substances.

Date of Government Version: 08/08/00 Date Made Active at EDR: 09/06/00 Database Release Frequency: Quarterly Date of Data Arrival at EDR: 08/11/00

Elapsed ASTM days: 26

Date of Last EDR Contact: 10/31/00

## FEDERAL ASTM SUPPLEMENTAL RECORDS

**BRS:** Biennial Reporting System

Source: EPA/NTIS

Telephone: 800-424-9346

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG)

and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/97

Database Release Frequency: Biennially

Date of Last EDR Contact: 09/18/00

Date of Next Scheduled EDR Contact: 12/18/00

CONSENT: Superfund (CERCLA) Consent Decrees

Source: EPA Regional Offices

Telephone: Varies

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: N/A

Database Release Frequency: Varies

Date of Last EDR Contact: N/A

Date of Next Scheduled EDR Contact; N/A

**ROD:** Records Of Decision

Source: NTIS

Telephone: 703-416-0223

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical

and health information to aid in the cleanup.

Date of Government Version: 01/31/99

Database Release Frequency: Annually

Date of Last EDR Contact: 10/12/00

Date of Next Scheduled EDR Contact: 01/08/01

## **GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING**

Date of Government Version: 04/17/95

Database Release Frequency: No Update Planned

Date of Last EDR Contact: 09/12/00

Date of Next Scheduled EDR Contact: 12/11/00

TRIS: Toxic Chemical Release Inventory System

Source: EPA

Telephone: 202-260-1531

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and

land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/97

Database Release Frequency: Annually

Date of Last EDR Contact: 09/25/00

Date of Next Scheduled EDR Contact: 12/25/00

TSCA: Toxic Substances Control Act

Source: EPA

Telephone: 202-260-1444

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant

site.

Date of Government Version: 12/31/98

Database Release Frequency: Every 4 Years

Date of Last EDR Contact: 09/12/00

Date of Next Scheduled EDR Contact: 12/11/00

#### STATE OF MICHIGAN ASTM STANDARD RECORDS

SHWS: Contaminated Sites

Source: Department of Environmental Quality

Telephone: 517-373-9541

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: 09/14/99
Date Made Active at EDR: 10/26/99

Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 09/29/99

Elapsed ASTM days: 27

Date of Last EDR Contact: 08/29/00

LF: Solid Waste Facilities Database

Source: Department of Environmental Quality

Telephone: 517-335-4035

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 08/01/00 Date Made Active at EDR: 09/14/00

Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 08/08/00

Elapsed ASTM days: 37

Date of Last EDR Contact: 09/25/00

LUST: Leaking Underground Storage Tank Sites Source: Department of Environmental Quality

Telephone: 517-335-3075

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 12/16/99
Date Made Active at EDR: 02/18/00
Database Release Frequency: Annually

Date of Data Arrival at EDR: 01/20/00 Elapsed ASTM days: 29 Date of Last EDR Contact: 09/21/00

# GEOCHECK®- PHYSICAL SETTING SOURCE ADDENDUM

## TARGET PROPERTY ADDRESS

CONSUMERS POWER NORTH SITE/MDEQ AMPERSEE ST/SHERWOOD AVE KALAMAZOO, MI 49001

#### TARGET PROPERTY COORDINATES

Latitude (North):

42.296600 - 42' 17' 47.8"

Longitude (West):

85.570702 - 85' 34' 14.5"

Universal Tranverse Mercator: Zone 16 UTM X (Meters):

617824.4

UTM Y (Meters):

4683483.5

EDR's GeoCheck Physical Setting Source Addendum has been developed to assist the environmental professional with the collection of physical setting source information in accordance with ASTM 1527-00, Section 7.2.3. Section 7.2.3 requires that a current USGS 7.5 Minute Topographic Map (or equivalent, such as the USGS Digital Elevation Model) be reviewed. It also requires that one or more additional physical setting sources be sought when (1) conditions have been identified in which hazardous substances or petroleum products are likely to migrate to or from the property, and (2) more information than is provided in the current USGS 7.5 Minute Topographic Map (or equivalent) is generally obtained, pursuant to local good commercial or customary practice, to assess the impact of migration of recognized environmental conditions in connection with the property. Such additional physical setting sources generally include information about the topographic, hydrologic, hydrogeologic, and geologic characteristics of a site, and wells in the area.

Assessment of the impact of contaminant migration generally has two principle investigative components:

- 1. Groundwater flow direction, and
- 2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata. EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Site-Specific Hydrogeological Data\*:

Search Radius:

2.0 miles

Status:

Not found

#### **AQUIFLOW®**

Search Radius: 2.000 Miles.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

	LOCATION	GENERAL DIRECTION
MAP ID	FROM TP	GROUNDWATER FLOW
1	1/4 - 1/2 Mile WSW	Not Reported
2	1/4 - 1/2 Mile North	NW
2 3	1/4 - 1/2 Mile West	E
4	1/4 - 1/2 Mile South	Not Reported
5	1/2 - 1 Mile NW	ENE
6	1/2 - 1 Mile SSE	Not Reported
6 . 7	1/2 - 1 Mile West	Not Reported
8	1/2 - 1 Mile South	Not Reported
11	1/2 - 1 Mile WSW	Ε
13	1 - 2 Miles SW	Not Reported
14	1 - 2 Miles South	Not Reported
15	1 - 2 Miles NNW	Not Reported
16	1 - 2 Miles WSW	E
17	1 - 2 Miles West	Not Reported
A18	1 - 2 Miles SSE	Not Reported
A19	1 - 2 Miles SSE	Not Reported
20	1 - 2 Miles SE	Not Reported
21	1 - 2 Miles WSW	Not Reported
22	1 - 2 Miles NNW	Not Reported
B23	1 - 2 Miles SE	Not Reported
24	1 - 2 Miles WNW	Not Reported
B25	1 - 2 Miles SE	NNW
26	1 - 2 Miles SE	N
27	1 - 2 Miles SSW	N
28	1 - 2 Miles WNW	Not Reported
29	1 - 2 Miles SSE	Not Reported

For additional site information, refer to Physical Setting Source Map Findings.

## GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than sitty-clayey types of soils.

## GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

			Soil Layer	Information		
Boundary			Classit	fication		
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)
3	38 inches	55 inches	sand	A-2-4	COURSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 20.00 Min: 6.00
4	55 inches	60 inches	stratified	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COURSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 20.00 Min: 6.00

#### OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: sandy loam

muck loamy sand

fine sand

Surficial Soil Types: sandy loam

muck

loamy sand fine sand

Shallow Soil Types:

sandy loam

loamy sand sandy clay loam

gravelly - sandy clay loam

silty clay loam

Deeper Soil Types:

muck

gravelly - sand fine sand

sand

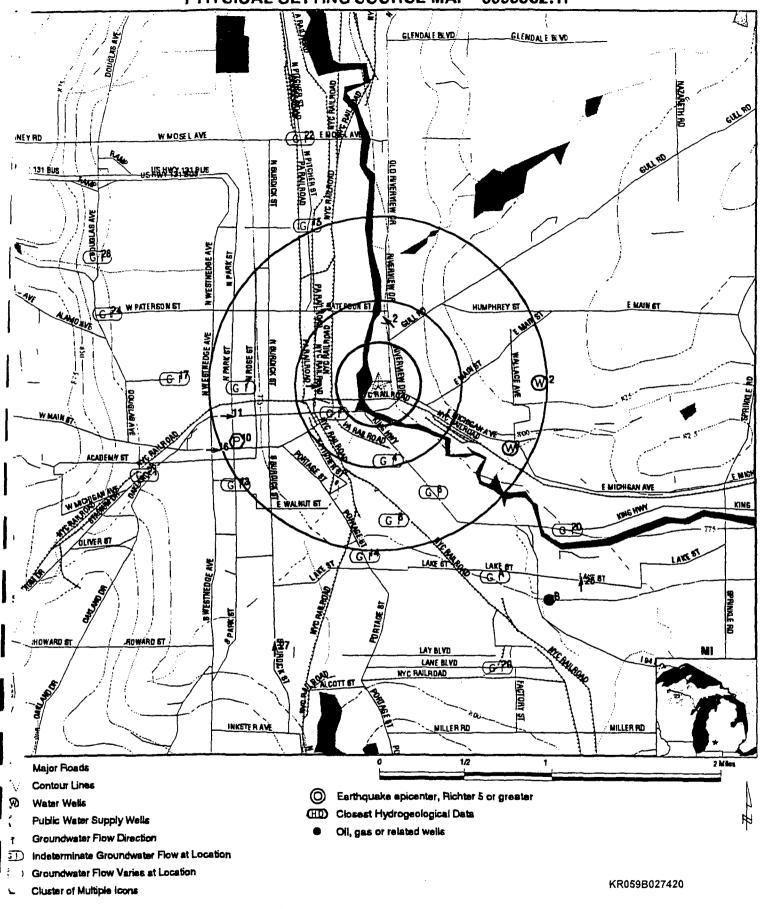
sand and gravel mucky-peat

KR059B027419

## ADDITIONAL ENVIRONMENTAL RECORD SOURCES

According to ASTM E 1527-00, Section 7.2.2, "one or more additional state or local sources of environmental records may be checked, in the discretion of the environmental professional, to enhance and supplement federal and state sources... Factors to consider in determining which local or additional state records, if any, should be checked include (1) whether they are reasonably ascertainable, (2) whether they are sufficiently useful, accurate, and complete in light of the objective of the records review (see 7.1.1), and (3) whether they are obtained, pursuant to local, good commercial or customary practice." One of the record sources listed in Section 7.2.2 is water well information. Water well information can be used to assist the environmental professional in assessing sources that may impact groundwater flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

## PHYSICAL SETTING SOURCE MAP - 0559352.1r



# GEOCHECK®- PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation			Database	EDR ID Number
8 South 1/2 - 1 Mile Higher	Site ID: Groundwaler Flow: Shallowest Water Table Depth: Deepest Water Table Depth: Average Water Table Depth: Date:	390219 Not Reported Not Reported Not Reported Not Reported 02/24/1998	AQUIFLOW	35857
9 ESE 1/2 - 1 Mile Higher			MI WELLS	39721114001

## GEOCHECK®- PHYSICAL SETTING SOURCE MAP FINDINGS

PWS ID:

MI0003530

PWS Status:

Active

Date Initiated: PWS Name:

Not Reported Date Deactivated: Not Reported KALAMAZOO PSYCHTRIC REG HOSP

KALAMAZOO PSYCHTRIC REG HOSP

OAKLAND DRIVE, P O BOX A

KALAMAZOO, MI 49001

Addressee / Facility:

Not Reported

Facility Latitude:

Not Reported

Facility Longitude: Not Reported

City Served:

Not Reported Untreated

Population:

1,400

Treatment Class:

PWS currently has or had major violation(s) or enforcement:

No

11 WSW 1/2 - 1 Mile Higher Site ID:

390243

E

Shallowest Water Table Depth: Not Reported Deepest Water Table Depth: Not Reported

Average Water Table Depth:

Groundwater Flow:

Date:

09/09/1994

East 1/2 - 1 Mile Higher

MI WELLS

**AQUIFLOW** 

39721114002

35846

# GEOCHECK®-PHYSICAL SETTING SOURCE MAP FINDINGS

		•		
Map ID				
Direction				
Distance			<b>_</b>	
Elevation _			Database	EDR ID Numbe
14	Site ID:	390410		
South	Groundwater Flow:	Not Reported	AQUIFLOW	35901
1 - 2 Miles	Shallowest Water Table Depth:			
Higher	Deepest Water Table Depth:	Not Reported		
	Deepest Water Table Depth.	•		
	Average Water Table Depth:	Not Reported		
	Date:	11/18/1998		
15	Site ID:	390079	ACUIEL OW	25052
NNW	Groundwater Flow:	Not Reported	AQUIFLOW	35853
l - 2 Miles	Shallowest Water Table Depth:			
Higher	Deepest Water Table Depth:	Not Reported		
	Average Water Table Depth:	11		
	Date:	10/24/1996		
16	Site ID:	390258	AQUIFLOW	35030
NSW	Groundwater Flow:	E	AGGIFLOW	35839
1 - 2 Miles	Shallowest Water Table Depth:			
Higher	Deepest Water Table Depth:	Not Reported		
	Average Water Table Depth:	21		
	Date:	11/19/1998		
17	Site ID:	Not Reported	4.01.000	
Nest	Groundwater Flow:	Not Reported	AQUIFLOW	35886
1 - 2 Miles	Shallowest Water Table Depth:	Not Reported		
Higher	Deepest Water Table Depth:	Not Reported		
	Average Water Table Depth:	Not Reported		
	Date:	01/26/1999		
			· · · · · · · · · · · · · · · · · · ·	
<b>418</b>	Site ID:	Not Reported		
SSE	Groundwater Flow:	Not Reported	AQUIFLOW	358 <b>66</b>
1 - 2 Miles	Shallowest Water Table Depth:	Not Reported		
Higher	Deepest Water Table Depth:	Not Reported		
	Average Water Table Depth:	Not Reported		
	Date:	08/27/1991		
			<del></del>	<del></del>
A19	Site ID:	390063		
SSE	Groundwater Flow:	Not Reported	AQUIFLOW	35878
1 - 2 Miles	Shallowest Water Table Depth:	Not Reported		
Higher	Deepest Water Table Depth:	Not Reported		
	· · · · · · · · · · · · · · · · · · ·	Not Reported		
	Date:	04/17/1996		
20	Site ID:	Not Reported		
SE	= -=	Not Reported	AQUIFLOW	35874
		•		
	Shallowest Water Table Denth.	NOT REDORED		
1 - 2 Miles	Shallowest Water Table Depth:		•	
1 - 2 Miles	Deepest Water Table Depth:	Not Reported	•	
1 - 2 Miles Higher	Deepest Water Table Depth: Average Water Table Depth:		·	

# GEOCHECK®- PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation			Database	EDR ID Number
28 WNW 1 - 2 Miles Higher	Site ID: Groundwater Flow: Shallowest Water Table Depth: Deepest Water Table Depth: Average Water Table Depth: Date:	390387 Not Reported Not Reported Not Reported Not Reported 01/30/1995	AQUIFLOW	35826
29 SSE 1 - 2 Miles Higher	Site ID: Groundwater Flow: Shallowest Water Table Depth: Deepest Water Table Depth: Average Water Table Depth: Date:	Not Reported Not Reported Not Reported Not Reported Not Reported 08/14/1997	AQUIFLOW	35884

## PHYSICAL SETTING SOURCE RECORDS SEARCHED

#### HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 1999 from the U.S. Fish and Wildlife Service.

#### HYDROGEOLOGIC INFORMATION

## AQUIFLOW<sup>R</sup> Information System

Source: EDR proprietary database of groundwater flow information

EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

#### GEOLOGIC INFORMATION

## Geologic Age and Rock Stratigraphic Unit

Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

#### STATSGO: State Soil Geographic Database

The U.S. Department of Agriculture's (USDA) Soll Conservation Service (SCS) leads the national Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

#### ADDITIONAL ENVIRONMENTAL RECORD SOURCES

#### FEDERAL WATER WELLS

PWS: Public Water Systems

Source: EPA/Office of Drinking Water

Telephone: 202-260-2805

Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data

Source: EPA/Office of Drinking Water

Telephone: 202-260-2805

Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: In November 1971 the United States Geological Survey (USGS) implemented a national water resource information tracking system. This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on more than 900,000 wells, springs, and other sources of groundwater.

# **EXHIBIT STEAM PLANT-4**

## REMEDIAL ACTION PLAN

CONSUMERS ENERGY KALAMAZOO ASH SITE KALAMAZOO, MICHIGAN

APRIL 3, 2002 SME PROJECT NO. KE41177

KR059B027428



# Consultants in the geosciences, materials and the environment

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- Facility Asset Management
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- Air Quality
- Asbestos/Lead Based Paint
- Baseline Environmental Assessme.
- Due Care Analysis
- Environmental Site Assessment
- Hydrogeologic Evaluation
- Industrial Hygiene
- Landfill Services
- Pollution Prevention
- · Regulatory Compliance
- Remediation
- Risk Assessment
- Storm Water Discharge
- Underground Storage Tanks

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COPY OF MDEQ DIVISIBILITY DETERMINATION

APPENDIX C



PAGE NO.

## **EXECUTIVE SUMMARY**

This document provides for performing a remedial action at Consumers Energy's former Kalamazoo Ash site. The Kalamazoo Ash site is located in the City of Kalamazoo, Kalamazoo County, Michigan. The site, which comprises approximately 7.5 acres of land, is bounded on the north by Hotop Street, on the south by the Norfolk Southern right-of-way, on the west by the Kalamazoo River and on the east by Ampersee Street. The purpose of this RAP is to remove coal ash in order to achieve a limited residential closure for the site.

The site was used for coal ash disposal from power generating activities conducted on the south adjoining site. South of the site was originally a steam/electrical generating, coal-fueled power plant. The City of Kalamazoo Brownfield Redevelopment Authority acquired the site from the State of Michigan in 1997.

Previous subsurface investigations were conducted in March 1997 by Kieser & Associates and in February and July 2000 by Malcolm Pirnie. The results of the assessments indicated the site met the designation of a "facility" based on concentrations of arsenic, barium, copper, chromium, lead, mercury, selenium, sliver, zinc, tetrachloroethene (PCE) and/or vinyl chloride in soil and/or groundwater exceeding Part 201 Generic Residential Cleanup Criteria.

With respect to the PCE and vinyl chloride identified in the coal ash and groundwater, respectively, Consumers Energy has received a divisibility determination from the MDEQ Environmental Response Division. The MDEQ has indicated the presence of volatile organic compounds (VOCs) in the soil and groundwater is due to an offsite source and is not the result of historical onsite activities. Therefore, Consumers Energy is not responsible for further remedial activities regarding the VOCs.

The three primary exposure pathways identified at the site based on identified metals impact from the coal ash are: 1. Groundwater Contamination Risk of Hazard to Surface Water Resources; 2. Soil Contamination Risks from Direct Contact Exposures, and 3. Soil Contamination Risk for Groundwaters to Pose Hazard to Surface Water.

The proposed remedial action will consist of excavating and transporting the coal ash to an off-site location where the ash material will be used as backfill. The fill site will be the Crown Vantage Landfill, a Type III landfill, in Parchment, Michigan. With the exception of the south side of the site, the coal ash material will generally be excavated to an elevation of approximately 761 feet above mean sea level (MSL). However, at the south end of the site, the final surface will be ramped up to meet existing grade at approximately 771 feet above MSL. It is estimated the total volume of coal ash to be removed from the site will be approximately 180,000 cubic yards (in-place). Forty-eight post excavation soil samples will be collected and submitted for laboratory analysis of various metals by the Synthetic Precipitation Leaching Procedure. The proposed remedial action will include the preparation of a Restrictive Covenant for the site by the City of Kalamazoo that will prevent future site owners from utilizing the underlying groundwater as a resource. The Restrictive Covenant will be recorded with the Register of Deeds for Kalamazoo County.

The summary presented above is general in nature and should not be considered apart from the entire text of the report with all the qualifications and considerations mentioned therein. Details of Soil and Materials Engineers, Inc, (SME) findings and recommendations are discussed in the following sections and in the appendices of this Remedial Action Plan.

## 1. INTRODUCTION

This document provides for performing a remedial action at Consumers Energy's former Kalamazoo Ash site. The following Remedial Action Plan (RAP) has been prepared in accordance with the Michigan Department of Environmental Quality (MDEQ) document titled "Suggested Format and Contents for Remedial Action Plans," dated May 1999.

## 1.1 Site Location

The Kalamazoo Ash site is located in the City of Kalamazoo, Kalamazoo County, Michigan. The site, comprising approximately 7.5 acres of land, is bounded on the north by Hotop Street, on the south by the Norfolk Southern right-of-way, on the west by the Kalamazoo River and on the east by Ampersee Street. Figure No. 1 of Appendix A is a site location diagram. Figure No. 2 of Appendix A depicts the site lay out, adjoining property features, surface sample locations, soil boring/monitoring well locations and the proposed area of excavation at the site.

## 1.2 Past and Current Property Use and Hazardous Substances

Consumers Energy and its power-generating company predecessors owned the ash site from approximately 1911 to the early 1970s. Prior to 1911 and at least to the 1870s, the site was owned by Kalamazoo Water Power and Manufacturing Company. Reportedly, before ownership by the Kalamazoo Water Power and Manufacturing Company, various individuals owned the site.

The site was used for coal ash disposal from power generating activities. South of the site was a steam/electrical generating, coal-fueled power plant.

The site is currently owned by the City of Kalamazoo Brownfield Redevelopment Authority (BRA). The City of Kalamazoo BRA acquired the site from the State of Michigan in 1997, and intends to redevelop the site with residential housing. The State of Michigan previously owned the site as a result of tax reversion in June 1985.

Currently, the surface of the coal ash is approximately 20 to 25 feet above the elevation of the Kalamazoo River. Reportedly, no cover soil is evident over the coal ash, and vegetative cover and trees are present at the surface of the coal ash. It is SME's understanding that redevelopment activities have not occurred due to the presence of the coal ash.

## 1.3 Rationale for Facility Designation

In March 1997, Kieser & Associates (Kieser) performed a Phase II Environmental Site Assessment (ESA) which included collecting two surface samples from the coal ash disposal area on the site. In addition, in February and July 2000, Malcolm Pirnie performed a site subsurface investigation, which consisted of collecting soil and groundwater samples at

the site, installing groundwater monitoring wells, and performing a geotechnical evaluation for site suitability.

The results of the assessments indicated the site met the designation of a "facility" as provided in Section 324.20101(1)(o) of Part 201 of the Natural Resources and Environmental Protection Act (NREPA), Act 451 of 1994 amended. Specific compounds that exceeded the cleanup criteria as defined in Section 324.20120a(1) of Part 201 consisted of arsenic, barium, chromium, copper, lead, mercury, selenium, silver, zinc and tetrachloroethene (PCE) in the soil; and copper, selenium, and vinyl chloride in the groundwater.

## 1.4 Purpose and Scope

The purpose of this RAP is to remove coal ash in order to achieve a limited residential closure for applicable pathways at the site. Once coal ash has been removed, the City of Kalamazoo BRA intends to encourage redevelopment of the site for residential use. The intended use of the site is consistent with limited residential land use exposure assumptions. Therefore, the Part 201 Residential and Commercial Subcategory I generic cleanup criteria are the appropriate criteria for comparison to site data of soil and groundwater contamination.

Prior to preparing this RAP, a meeting was held with the MDEQ, the City of Kalamazoo and Consumers Energy on February 28, 2002, to discuss remedial action activities at the Kalamazoo Ash site. Based on conversations between the MDEQ, City of Kalamazoo and Consumers Energy, SME prepared this RAP for the Kalamazoo Ash site on behalf for Consumers Energy and the City of Kalamazoo. The MDEQ has issued a divisibility determination dated March 26, 2002 regarding the presence of VOCs at the site. A copy of the divisibility determination is presented in Appendix C. According to the MDEQ, the presence of VOCs in the soil and groundwater was due to an offsite source and was not the result of historical onsite activities. Therefore, Consumers Energy is not responsible for further remedial activities regarding the VOCs.

The scope for this RAP will include performing activities associated with coal ash removal at the site. The excavation limits of coal ash to be removed have been pre-selected and agreed upon by the MDEQ, City of Kalamazoo and Consumers Energy. Based on the site topography, the estimated excavation completion grade will be approximately 761 feet above mean sea level (MSL). Figure No. 2 of Appendix A shows the proposed excavation area at the site. Post excavation soil samples will be collected at the completion of excavation activities. Figure No. 3 of Appendix A shows post excavation soil sampling locations.



The project will also include monitoring of excavation and hauling both at the site and at the proposed fill facility, the Crown Vantage Landfill (CVL) in Parchment, Michigan. A closure report will be prepared for a Limited Residential Closure.

# 2. FACILITY CHARACTERIZATION, ANALYSIS AND REMEDIAL ACTION

## 2.1 Facility Characterization

The Kalamazoo Ash site was used for coal ash disposal from the power generating activities conducted south of the site. Currently, the surface of the coal ash is approximately 20 to 25 feet above the elevation of the Kalamazoo River. Reportedly, no cover soil is evident over the ash, and vegetative cover and trees are present at the surface of the coal ash.

The description of soil conditions at the site is based on the boring logs from the subsurface investigation conducted by Malcolm Pirnie in February 2000. The boring logs corresponding to MW-1, MW-2, MW-3 and DB-1 indicate that ash material at the site extends from grade to depths ranging from 20 to 27 feet below grade (BG). The coal ash is gray to black in color and grain size analyses conducted by Malcolm Pirnie describe the coal ash as generally a fine sandy silt with a trace to coarse sand to fine gravel. At MW-1, MW-2, MW-3 and DB-1 the coal ash was underlain by native soil, which consisted predominantly of fine to coarse sand with varying amounts of silt and gravel. Some native interbedded silt and clay layers were encountered at MW-1 and MW-3 just below the coal ash material. Coal ash material was also encountered at GSI-2 and GSI-3, extending from approximately 3 inches BG and 2 feet BG, respectively, to the termination depths of the borings, approximately 4 feet BG. However, coal ash material was not encountered at GSI-1 and GSI-4.

Groundwater at the Kalamazoo Ash site was encountered at depths ranging from approximately 1.3 to 2.8 feet BG in wells located along the Kalamazoo River, GSI-1 through GSI-4, to depths ranging from approximately 24 to 29 feet BG in wells located on the coal ash pile, MW-1, MW-2 and MW-3. Groundwater elevation data indicated groundwater flow is to the west toward the Kalamazoo River.

GSI Protection and GSI criteria for barium, cadmium, copper, lead, nickel and zinc were calculated using the MDEQ spreadsheet "Calculation of Generic Facility-Specific Part 201 Groundwater Surface Water Interface (GSI) Criteria for {G} Footnoted Hazardous Substances," dated June 23, 2000. This spreadsheet incorporates the Final Chronic Value (FCV) formula presented in Footnote {G} of the tabulated Part 201 Generic Cleanup Criteria and Screening Levels dated June 7, 2000. The surface water hardness value used in the FCV formula was 265 parts per million based on data obtained for the Kalamazoo River in the

U.S. Geological Survey Water Resources Data-Michigan for 1994. For the purposes of establishing GSI Protection and GSI Criteria, it is assumed that Kalamazoo River is not a drinking water source. The GSI Protection Criteria used for these metals was the higher of the Soil-Water Partition Value for GSI or (20x) the calculated GSI criteria. However, for soil, where the GSI Protection Criteria is less than the Statewide Default Background Concentration, the Statewide Default Background Concentration is used for comparison.

## 2.1.1 Analytical Results - March 1997

Kieser submitted two surface samples to an analytical laboratory in March 1997. The surface samples (SS-01 and SS-02) were collected from the coal ash disposal area located north of the railroad right-of-way. Figure No. 2 of Appendix A shows the surface sample locations. Reportedly, samples were collected of the coal ash from beneath the existing vegetative cover. Samples were submitted to an analytical laboratory for analyses of the 10 Michigan Metals, nickel, polychlorinated biphenyls (PCBs), and polynuclear aromatic hydrocarbons (PAHs). Table 1 in Appendix B lists the analytical results for the two surface samples collected by Kieser.

Arsenic was detected at concentrations ranging from 14.4 milligrams per kilogram (mg/kg) to 19.7 mg/kg, which exceeded the Part 201 Residential Direct Contact Criterion (DCC) of 7.6 mg/kg. The Residential DCC is referenced because the criterion is the most restrictive. It should be noted the concentrations were below the Part 201 Residential Drinking Water Protection Criterion (DWPC) of 23 mg/kg or Part 201 Residential Groundwater/Surface Water Interface (GSI) Protection Criterion of 70 mg/kg.

PCBs and PAHs were not detected above either the analytical laboratory method detection levels (MDLs) or the applicable Part 201 residential cleanup criteria.

Based on a review of the data, the expected fate of the arsenic would be to migrate toward groundwater. Since the contaminants are not volatile in nature, it is not expected that volatilization will occur. Transport mechanisms for the contaminants would be limited to infiltration via precipitation, gravity drainage, and surface runoff to the Kalamazoo River. In addition, the levels of arsenic detected were below the DWPC and GSI protection criteria.

# 2.1.2 Analytical Results - February and July 2000

## Coal Ash and Native Soil

In February 2000, Malcolm Pirnie collected coal ash and native soil samples from soil borings MW-1, MW-2, MW-3, DB-1, GSI-1, GSI-2, GSI-3 and GSI-4. Figure No. 2 of Appendix A shows the soil boring locations. At MW-1, MW-2, MW-3 and DB-1, samples were collected from depths of 4 to 6 feet BG, 14 to 16 feet BG, as well as at and just above the water table, approximately 20 to 30 feet BG. At GSI-1, GSI-2, GSI-3 and MW-1, MW-2, MW-3 and

DB-1, samples were collected from depths of 1.5 to 2 feet BG. Samples were submitted to an analytical laboratory for analyses of one or more of the following compounds: VOCs, 10 Michigan Metals, PCBs and Pesticides and base/neutral and acid extractable compounds (BNAs). Table 1 in Appendix B is a table summarizing the analytical results for the samples collected by Malcolm Pirnie.

Based on a review of the results, one or more of the 10 Michigan Metals were detected at concentrations exceeding applicable Part 201 residential cleanup criteria in each of the samples collected from MW-1, MW-2, MW-3 and DB-1. The metal concentrations exceeded one or more of the following residential criteria: DWPC, GSI Protection Criteria or DCC. As with arsenic detected in the ash during Kieser's assessment, the expected fate of the metals would be to migrate toward groundwater. Since the contaminants are not volatile in nature, it is not expected that volatilization will occur. Transport mechanisms for the contaminants would be limited to infiltration via precipitation, gravity drainage, and surface runoff to the Kalamazoo River.

PCE was detected at MW-1 (4-6 feet BG) and at MW-3 (4-6 feet BG). However, as previously stated, Consumers Energy was informed that the MDEQ would prepare a divisibility determination regarding the presence of PCE in the soil.

PCBs, pesticides, and BNAs were not detected above either the analytical laboratory MDLs or the applicable Part 201 residential cleanup criteria in the samples analyzed at the site.

#### Groundwater

After completion of each soil boring at MW-1, MW-2 and MW-3, a groundwater monitoring well was installed in the borehole. In addition, four groundwater/surface water interface (GSI) monitoring wells (GSI-1, GSI-2, GSI-3 and GSI-4) were installed along the Kalamazoo River bank. Groundwater samples were collected from the wells on February 25, 2000 and July 26, 2000. A groundwater sample was also collected MW-1 on August 9, 2000. Figure No. 2 of Appendix A shows the monitoring well locations. In addition, Table 2 of Appendix B lists the analytical results for the groundwater sampling events.

Copper and selenium were reported at concentrations slightly exceeding the Part 201 Residential GSI of 21 ug/L and 5 ug/L, respectively. Specifically, MW-2 reported a copper concentration of 25 ug/L and GSI-3 reported a selenium concentration of 13 ug/L. The concentrations were reported during the February 25, 2000 sampling event. The copper and selenium concentrations at MW-2 and GSI-3 were not confirmed during the July 26, 2000 sampling event. For the July 26, 2000 sampling neither copper or selenium were detected above the MDL.

During the February and July 2000 sampling events, vinyl chloride was detected at concentrations exceeding the Part 201 Residential Drinking Water Criterion (DWC) and Part 201 Residential GSI Criterion at MW-1 and GSI-4. Again, Consumers Energy was informed that the MDEQ would prepare a divisibility determination regarding the presence of vinyl chloride in the groundwater.

PCBs, pesticides, and BNAs were not detected above either the analytical laboratory MDLs or the applicable Part 201 residential cleanup criteria in the samples analyzed at the site.

#### 2.2 Facility Analysis/Conditions Evaluation

Analytical results were compared to MDEQ Part 201 Generic Residential Cleanup Criteria judged by SME to be applicable. The results were compared to applicable MDEQ criteria to evaluate whether the following facility conditions and exposure risks were within criteria.

#### 2.2.1 Control of Hazardous Substances Sources

No hazardous substances sources are known to be present at the Kalamazoo Ash site. Therefore, control of known hazardous substance sources is not applicable.

#### 2.2.2 Groundwater Contamination Risks to Drinking Water Uses

No constituents associated with coal ash were detected above MDEQ Part 201 Generic Residential Drinking Water Criteria in the groundwater at the Kalamazoo Ash site. As a result, groundwater contamination risks to drinking water uses are not indicated at the Kalamazoo Ash site.

#### 2.2.3 Groundwater Contamination Risks from Dermal (Utility Work) Exposures

No constituents associated with coal ash were detected above Part 201 Generic Residential Groundwater Contact Criteria in the groundwater at the Kalamazoo Ash site. Therefore, no groundwater contamination risks from dermal (utility work) exposures are known to be present at the Kalamazoo Ash site.

#### 2.2.4 Groundwater Contamination Risks for Indoor Air Hazards

No constituents associated with coal ash were detected above Part 201 Generic Residential Groundwater Volatilization to Indoor Air Inhalation in the groundwater at the Kalamazoo Ash site. Therefore, groundwater contamination risks for indoor air hazards are not indicated at the Kalamazoo Ash site.



#### 2.2.5 Groundwater Contamination Risk of Hazard to Surface Water Resources

As previously stated, the Kalamazoo River adjoins the Kalamazoo Ash site to the west. For the February 2000 groundwater sampling event, selenium and copper were the only constituents detected at a concentration exceeding Part 201 Residential GSI. The concentrations of selenium and copper in February 2000 were only slightly above the GSI criteria. In addition, selenium and copper were not detected in groundwater for the July 2000 groundwater sampling event. Therefore, groundwater contamination risk of hazard to surface water resources is indicated to be minimal.

#### 2.2.6 Soil Contamination Risks from Direct Contact Exposures

Generally, arsenic was detected in the coal ash at the site at concentrations greater than the Part 201 Residential DCC of 7.6 mg/kg. Arsenic concentrations ranging from 8.1 mg/kg to 47 mg/kg were detected at depths ranging from 0.25 to 28 feet BG. In addition, lead was detected at a concentration of 7,250 mg/kg at MW-3 at a depth of 26 to 28 feet. The Part 201 Residential DCC for lead is 400 mg/kg. However, it should be noted that lead impact was not confirmed at shallower depths expected to be contacted during remedial efforts, grade to approximately 20 feet BG.

Soil contamination risks from direct contact exposure with arsenic is applicable at the Kalamazoo Ash site. However, a future direct contact exposure with lead is not indicated because of the depth of impact and non-impacted overlying soil and the planned remedial activities.

#### 2.2.7 Soil Contamination Risks from Ambient Air Inhalation Exposures

No constituents associated with coal ash were detected above Part 201 Generic Residential Particulate Soil Inhalation Criteria or Part 201 Infinite Source Volatile Inhalation Criteria in the soil at the Kalamazoo Ash site. Therefore, soil contamination risks from ambient air exposures are not indicated at the Kalamazoo Ash site.

#### 2.2.8 Soil Contamination Risks from Indoor Air Inhalation Exposures

No constituents associated with coal ash were detected above Part 201 Generic Residential Volatilization to Indoor Air Criteria in the soil at the Kalamazoo Ash site. Therefore, soil contamination risks from indoor air inhalation exposures are not indicated at the Kalamazoo Ash site.



#### 2.2.9 Soil Contamination Risk of Injury to Drinking Water Uses of Groundwater

Arsenic, lead, selenium and zinc were detected at concentrations exceeding the Part 201 Residential DWPC in various soil samples on the site. However, no drinking water wells are known to be present at the Kalamazoo Ash site or within a one-mile radius of the site. SME understands city water service will be provided by the City of Kalamazoo.

Furthermore, no arsenic, lead, selenium or zinc was detected above the either the analytical laboratory MDL or Part 201 Residential DWC in groundwater at the site.

Therefore, soil contamination risks of injury to drinking water uses of groundwater are not indicated at the Kalamazoo Ash site.

#### 2.2.10 Soil Contamination Risk for Groundwaters to Pose Dermal Contact Hazard

No constituents associated with coal ash were detected above Part 201 Generic Residential Groundwater Contact Criteria in the soil at the Kalamazoo Ash site. Therefore, a soil contamination risk for groundwater to pose a dermal contact hazard is not indicated at the Kalamazoo Ash site.

#### 2.2.11 Soil Contamination Risk for Groundwaters to Pose Hazard to Surface Water

Barium, cadmium, chromium, copper, lead, mercury, selenium, silver and zinc were detected at concentrations exceeding the Part 201 Residential GSI Protection Criteria in various coal ash samples on the site, but only selenium and copper have been detected in groundwater at concentrations exceeding Part 201 Residential GSI in February 2000. In addition, selenium and copper were not detected in groundwater samples collected in July 2000. Therefore, the risk of soil contamination relative to GSI is indicated to be minimal and will be reviewed further by remedial activities.

#### 2.2.12 Risk of Contaminated Soils Runoff to Surface Waters

The proposed remedial action will remove stockpiled coal ash from the site therefore significantly mitigating the risk of contaminated soils runoff to surface waters.

#### 2.2.13 Surface Water Sediment Contamination Risk

Although sediment was not sampled from the Kalamazoo River in preparation of this RAP, a review of analytical data collected from the site has indicated that a risk of surface water sediment contamination does not appear to be applicable as a result of the coal ash. The rationale for this decision includes: 1) surface water will not be contacted during remedial efforts, 2) groundwater is not impacted (transport mechanism) with coal ash

constituents, 3) surface runoff of ash/soil will be controlled during remedial activities, and 4) metals do not appear to be leaching into the groundwater from the ash/soil based on the results of the most recent set of groundwater samples.

It should be noted that other sediment impacts have been documented and confirmed by the MDEQ in the Kalamazoo River. The impacts have been associated with historical activities not associated with the Kalamazoo Ash site.

#### 2.2.14 Acute Toxic and Physical Hazard Risks

Acute toxic or physical hazard risks are not indicated at the Kalamazoo Ash site.

#### 2.2.15 Ecological and Aesthetic Impacts

Ecological or aesthetic impacts to the environment are not indicated at the Kalamazoo Ash site.

#### 2.2.16 Other Risks from Hazardous Substance Releases at or Posed by the Facility

Other risks from hazardous substance releases at the Kalamazoo Ash site or posed by the Kalamazoo Ash site are not indicated.

#### 2.3 Proposed and Completed Remedial Actions

No remedial actions have been conducted to date at the site. Consumers Energy proposes to excavate and transport stockpiled coal ash material from the site to an off-site location where it will be used as backfill. Figure No. 2 of Appendix A shows the proposed limits of the excavation activities. Coal ash material will be excavated using excavators and placed directly in haul trucks for transport to CVL in Parchment, Michigan. The CVL is a Type III landfill. With the exception of the south side of the site, the coal ash material will generally be excavated to an elevation of approximately 761 feet above mean sea level (MSL). However, at the south end of the site, the final surface will be ramped up to meet existing grade at approximately 771 feet above MSL. It is estimated the total volume of coal ash to be removed from the site will be approximately 180,000 cubic yards (in-place). The coal ash material at the CVL will be capped with a geosynthetic membrane at the completion of backfill activities. Additional details regarding the proposed remedial action are discussed below.



#### 3. IMPLEMENTATION DETAILS AND DOCUMENTATION

#### 3.1 Documentation That Criteria Are Appropriate for the Site

Analytical results from soil and groundwater samples collected during previous site investigation activities conducted by others have been compared to Part 201 Generic Residential Cleanup Criteria.

#### 3.2 Identification of Rationale for Indicator Parameters

Since the MDEQ has stated the coal ash is an inert material, the proposed remedial action will not include the collection of VSR samples during or at the completion of excavation activities. Therefore, a discussion of the rationale for indicator parameters with respect to the proposed remedial action is not relevant. However, post excavation soil samples will be collected and the plan for these samples is discussed in Section 3.8.

#### 3.3 Source Control Analysis

Again, the MDEQ has stated that the coal ash is an inert material. In addition, most of the coal ash, i.e. source material, will be removed from the site during the proposed remedial action.

Coal ash material disposed of at the CVL will be capped with geosynthetic membrane at the completion of backfilling activities.

#### 3.4 Schedule

The tentative implementation schedule is to begin excavation activities by April 15, 2002 and complete by August 1, 2002.

#### 3.5 Implementation/Construction Monitoring

SME technicians will be on-site and at the CVL throughout the implementation of the proposed corrective action. SME will document site activities on a daily basis including but not limited to the volumes of coal ash material leaving the site and backfilled at the CVL. A "bill of ladling" will be completed for each haul truck leaving the site for the transport of coal ash to the CVL. The basis for determining excavation activities have been completed will be confirmation of the final elevation of the restored surface, i.e. 761 feet above MSL. A registered surveyor will conduct confirmation of the final elevation.

#### 3.6 Operation and Maintenance Plans

During the implementation of the proposed remedial action, efforts will be made to limit the migration of coal ash onto roadways from the site to the CVL. As necessary, local streets will be swept cleaned. In addition, dust control measures consisting of applying water to the site haul road will be implemented when deemed necessary. Since no post remedial

action activities are planned for the site, the implementation of an operation and maintenance plan after the completion of the proposed remedial action will not be necessary.

#### 3.7 Plan for Well Abandonment

Monitoring wells MW-1, MW-2 and MW-3 will be abandoned prior to the implementation of the proposed remedial action. The abandonment procedures will consist of tremie grouting the wells from the base of the wells to grade with a bentonite/cement slurry. At this time there are no plans to abandon monitoring wells GSI-1, GSI-2 and GSI-3 since these wells appear to be beyond the limits of the proposed excavation.

#### 3.8 Monitoring Plans

As previously stated, post excavation soil samples will be collected at the completion of excavation activities in order to evaluate for potential exposures with respect to the GSI pathway. The selection of the proposed soil sample locations was based on the application of the MDEO's "Verification of Soil Remediation Guidance Document," (VSR), April, 1994, Revision 1. Specifically, in order to determine sample locations the site was gridded using the "large site" formula presented in the VSR document. The area within the property boundary of the former ash site was calculated to be approximately 7.5 acres. Using the "large site" formula, a grid interval of approximately 43 feet was calculated, which resulted in 193 grid elements. Each grid element was then numbered, beginning in the southwest corner of the site. For determining the appropriate number of sample locations, the number of grid elements was multiplied by 25 percent, which resulted in a total of 48 locations to be Forty-three of the locations to be sampled were then determined using a computerized random number generator. The remaining 5 sampling locations were biased in the vicinity of MW3, where previous analytical results had indicated concentrations of metals exceeding Part 201 Generic Residential Cleanup Criteria for the Drinking Water Protection. GSI Protection and Direct Contact exposure pathways. Figure No. 3 of Appendix A shows the proposed post excavation soil sample locations.

Prior to collecting the post-excavation soil samples, the sample locations will be staked by a registered surveyor. The post-excavation samples will then be collected as grab samples at grade. Post excavation soil samples will be submitted for laboratory analysis of the following metals by the Synthetic Precipitation Leaching Procedure (SPLP): arsenic, barium, chromium, mercury and selenium. Post excavation soil samples located in the vicinity of MW3 will also be submitted for laboratory analysis of copper, lead, silver and zinc, also by SPLP. The analytical methods, detection limits and appropriate sample jars are listed below.

Analytical Parameter	EPA Method Number	Target Detection Limits	Container w/ Preservative
Arsenic	1312/7061	5	2 x 16 oz. glass/NP
Barium	1312/7081	200	2 x 16 oz. glass/NP
Chromium(total)	1312/7191	50	2 x 16 oz. glass/NP
Соррег	1312/7211	25	2 x 16 oz. glass/NP
Lead	1312/7421	3	2 x 16 oz. glass/NP
Mercury	1312/7470	0.2	2 x 16 oz. glass/NP
Selenium	1312/7741	5.0	2 x 16 oz. glass/NP
Silver	1312/7761	0.5	2 x 16 oz. glass/NP
Zinc	1312/7950	20	2 x 16 oz. glass/NP

#### Notes:

- (1) TDLs are presented in parts per billion (ppb or micrograms per Liter (μg/L)).
- (2) NP = No Preservative.

Soil samples will be containerized in pre-cleaned containers supplied by the analytical laboratory. After sample collection, the containerized samples will be kept cool, i.e. refrigerated, until delivery to the analytical laboratory. SME field staff will follow chain of custody procedures documenting the sample handling sequence. Consumers Energy's Chemistry Section - Technical Services Department of Jackson, Michigan will provide laboratory analytical services.

In the event analytical results for post excavation soil samples exceed GSI criteria then additional measures including, but not limited to additional excavation at exceedance points, will be implemented.

No groundwater water monitoring will be conducted after the completion of excavation activities.

#### 3.9 Contingency Plans

A contingency plan has not been prepared for this RAP since the proposed remedial action is based on the one-time removal of the coal ash from the site.

#### 3.10 Evidence of Zoning

The site is zoned "2-Light Manufacturing." The City of Kalamazoo's zoning ordinance is pyramidal, generally allowing less intensive uses where heavier uses are allowed. Residential housing is permitted in all zoning districts except the heaviest, "1-General Manufacturing." Therefore, the site is already zoned to allow for residential development. As previously stated, the City of Kalamazoo BRA intends to encourage redevelopment of the site for residential use.



#### 3.11 Language for Restrictive Covenant

The City of Kalamazoo will prepare a Restrictive Covenant for the site that will prevent future site owners from utilizing the underlying groundwater as a resource. The proposed property restrictions to be listed with the Restrictive Covenant are presented below.

- 1. The owner shall appropriately handle and dispose of potentially impacted groundwater removed from the site.
- 2. The owner shall not install wells, drains, or other structures which utilize impacted groundwater for consumption, irrigation, on-site processes or other uses which would cause impacted groundwater to be redirected to a non-impacted area.
- 3. The owner shall restrict activities that may result in exposure to regulated substances above levels exceeding Part 201 Generic Residential Cleanup Criteria. In the event that excavation or subsurface work for any reason is completed on site the owner shall stipulate that workers follow an appropriate health and safety program including monitoring air in the work space for volatile organic compounds in accordance with applicable local, state, and federal guidelines.

The Restrictive Covenant will be recorded with the Register of Deeds for Kalamazoo County. A copy of the recorded Restrictive Covenant will be provided to the Michigan Department of Environmental Quality (MDEQ).

#### 3.12 Public Notification

Consumers Energy will notify the City of Kalamazoo and adjacent property owners of the proposed remedial action. The notification will consist of hand-delivered fliers to be personally delivered to the property owners. The fliers will include the following:

- a brief description of the work to be performed;
- a schedule including daily hours of operation; and
- a contact name and phone number for comments and complaints.

#### 3.13 Specifications for Permanent Markers

If necessary, the City of Kalamazoo will prepare permanent markers for the site.

#### 3.14 Proposed Financial Assurance Mechanism

If necessary, the City of Kalamazoo will prepare the proposed financial assurance mechanism (FAM).

#### 3.15 Proposed Legally Enforceable Agreement

If necessary, the City of Kalamazoo will prepare the legally enforceable agreement between the City of Kalamazoo and the MDEQ.

#### 4. REFERENCES

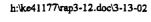
The following documents were referred to for the preparation of the RAP.

- "Phase I Environmental Site Assessment," dated January 10, 1997 and prepared by Kieser & Associates of Kalamazoo, Michigan.
- "Report of the Phase II Environmental Site Assessment," dated April 18, 1997 and 2. prepared by Kieser & Associates of Kalamazoo, Michigan.
- "Site Subsurface Investigation Report," dated June 25, 2001 and prepared by Malcolm Pirnie, Inc. of East Lansing, Michigan.
- "Suggested Format and Contents for Remedial Action Plans," dated May, 1999 and prepared by the Environmental Response Division of the Michigan Department of Environmental Quality.

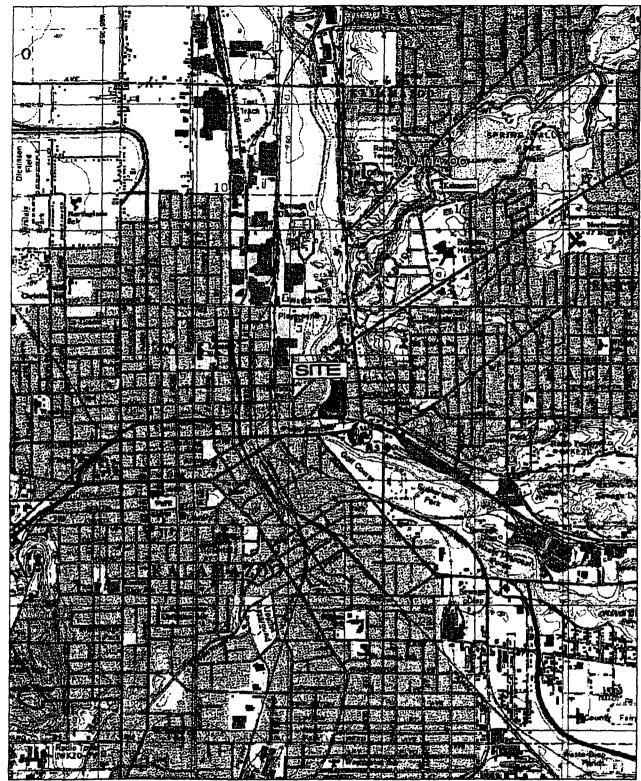
#### APPENDIX A

#### **FIGURES**

Figure No. 1 Site Location Diagram
Figure No. 2 Proposed Area of Excavation
Figure No. 3 Post Excavation Soil Sample Locations







SCALE: 1: 24,000 KALAMAZOO QUADRANGLE (1977)



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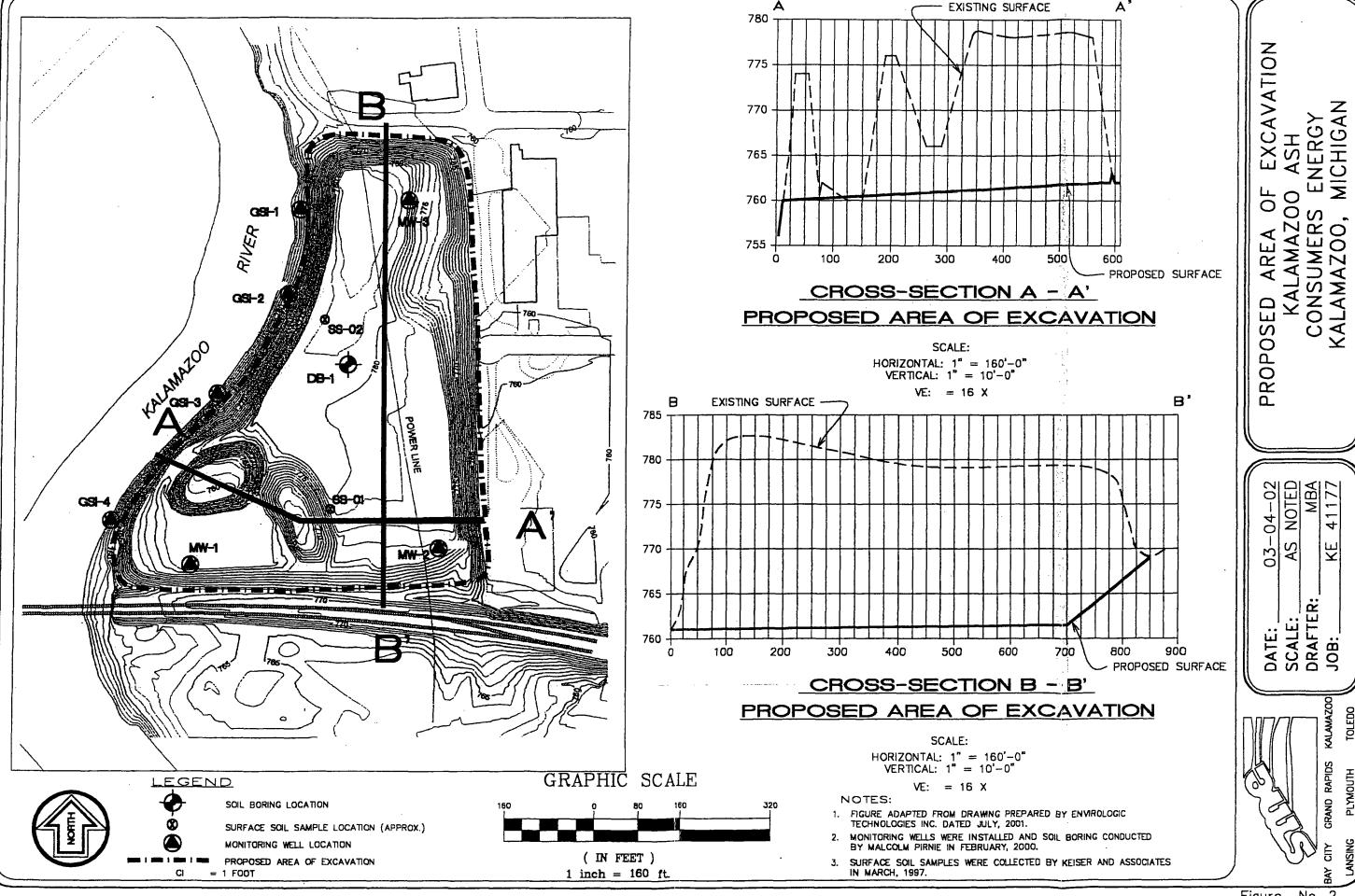
SITE LOCATION DIAGRAM KALAMAZOO ASH CONSUMERS ENERGY KALAMAZOO, MICHIGAN

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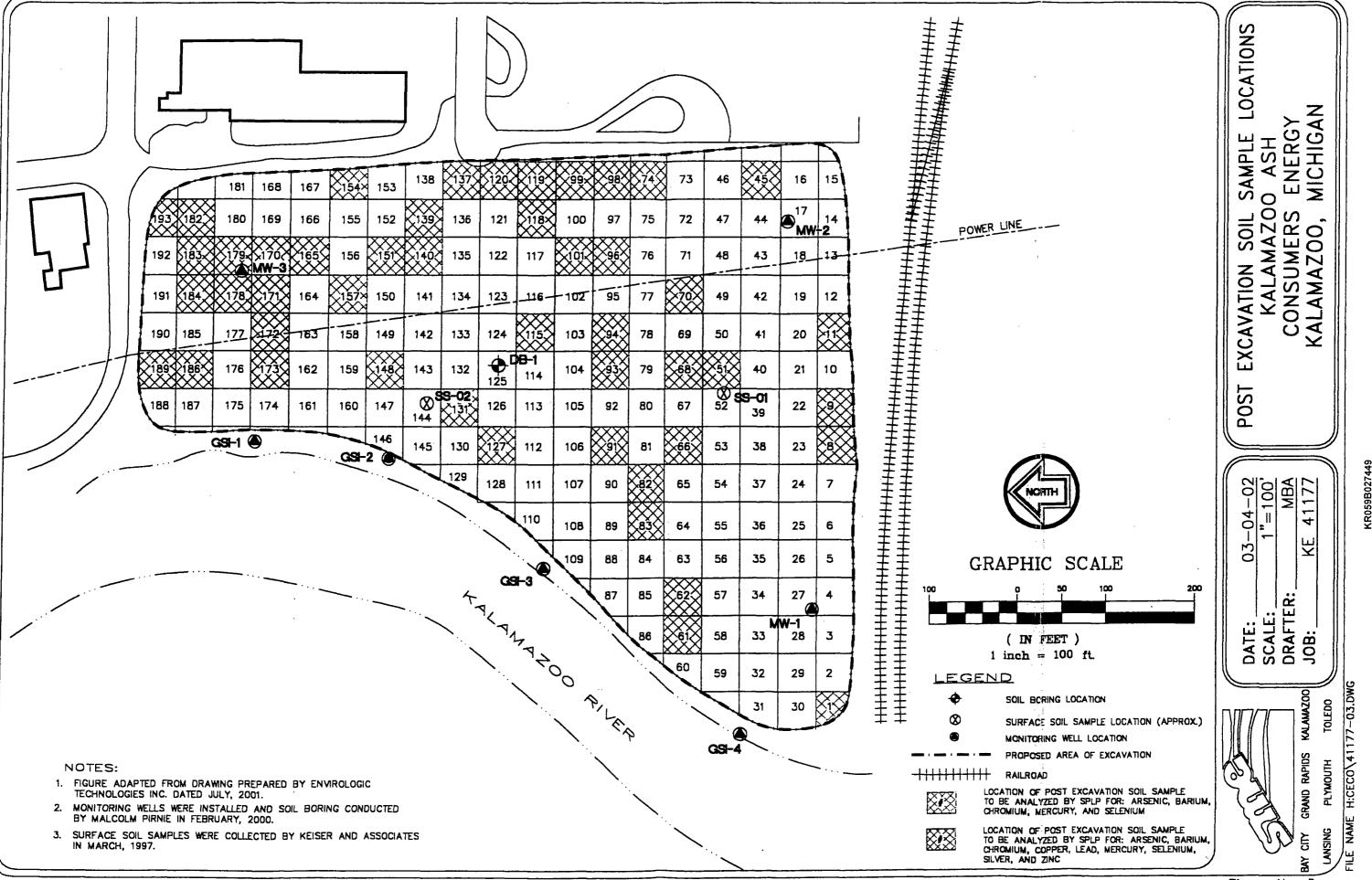


Figure No.

#### APPENDIX B

#### **TABLES**

Table 1	Coal Ash Analytical Results Summary
Table 2	Groundwater Analytical Results Summary

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#### TABLE 1

#### COAL ASH ANALYTICAL RESULTS SUMMARY KALAMAZOO ASH CONSUMERS ENERGY

SME Project No. KE41177 Page 1 of 2

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Chloroform	2,000	3,400	1,300,000,000	7,200	1,200,000	ND .	ND	ND	ND	ND	ND	ND	ND	ND
Other VOCs	NA.	NA NA	NA	NA	NA	NE NE	NE	ND	ND	ND	ND	NED	ND	ND

#### Notes:

- Concentrations reported in micrograms per kilogram (ug/kg) or milligrams per kilogram (mg/kg).
   Criteria taken from Operational Memorandum No. 18, Part 201 Generic Cleanup Criteria and Screening Levels, dated June 7, 2000
- 3. ID Inadequate data to develop RBSL.
- 4. NLV Hazardous substance is not likely to volatilize under most conditions.
- 5. NLL Chemical is not likely to leach under most soil conditions.
- 6. NA Not applicable. Various cleanup criteria are listed for each HNA, Pesticide and VOC compound. However, since detections were not identified except for compounds listed, cleanup criteria were not listed.
- 7. NE Not evaluated as part of the assessment activities.
- 8. ND Not detected above analytical laboratory method detection levels.
- 9. J Estimated value or value not accurate.
- 10. T Value reported is less than criteria of detection.
- 11. Hexavalent chromium used as conservative comparison.
- 12. Cleamup criteria defaults to Statewide Default Beckground Concentration.

# COAL ASH ANALYTICAL RESULTS SUMMARY KALAMAZOO ASH CONSUMIRS ENERGY SME Projec No. KE41177 Pags 2 of 2

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Notes:

1. Concentrations reported in micrograms per kilogram (ug/kg) or milligrams per kilogram (mg/kg).

2. Criteris taken from Operational Memorrandum No. 18, Part 201 Generic Cleamp Criteris and Servening Levels, dated June 7, 2000

3. ID - Inadequate data to develop RBSL.

4. NLV - Hazardous substance in not littled to volatilize under most conditions.

5. NLJ - Chemical is not littled to best under most conditions.

6. NA - Net applicable. Various elevant perfects are littled for each BNA, Pesticide and VOC compound. However, since detections were not identified except for compounds listed.

7. NE - Not evaluated as part of the assessment activities.

8. ND - Net detected above snakyical laboratory mathod detection levels.

9. J - Estimated value or values and accurate.

10. T. Value reported is less than criteria of detection.

11. Henravlated chromium used as conservative comparine.

12. Cleamp criteria defaults to Statewide Default Background Concentration.

13. HT - Recommended laboratory holding time was exceeded before analysis.

14. DM - Dilution required due to matrix problems.

TABLE 1

GROUNDWATER ANALYTICAL RESULTS SUMMARY
KALAMAZOO ASH
CONSUMERS ENERGY
SME Project No. KEA1177
Page 1 of 2

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Chloreform 100 170	28,000 NA	NA NA	2 <u>2</u>	22	22	22	2	2

1. Groundwater sampling was conducted by Malcolm Pinnie in February and July 2000.

2. Concorductions reported in micrograms per liter (ugL).

3. Concorductions reported in micrograms per liter (ugL).

4. Concorductions reported in micrograms per liter (ugL).

5. IN - Indequate data to develop RBSI.

5. IN - Indequate data to develop RBSI.

6. IN L. - Characters statem from Operations.

7. IN - Index dust data to develop resident or and of BNA, Pesticide and VOC compounds. However, since detections were not idealy to compounds listed for each order or index of BNA, Pesticide and VOC compounds. However, since detections were not ideal, desamp criteria are listed for each of BNA, Pesticide and VOC compounds. However, since detections were not ideal, desamp criteria are listed for each order of BNA, Pesticide and VOC compounds. However, since detections were not ideal, desamp criteria.

7. NA - Not explicable. Various cleanup criteria are listed for each of BNA, Pesticide and VOC compounds. However, since detections were not ideal, desamp criteria.

8. NE - Not evaluated as part of the assessment activities.

9. ND - Not detected above analytical laboratory method detection levels.

10. DL - Sample analyzed using a dilution (s).

11. Heravalent chromium used for conservative comparison.

TABLE 2

#### GROUNDWATER ANALYTICAL RESULTS SUMMARY KALAMAZOO ASH CONSUMERS ENERGY SME Project No. KE41177 Page 2 of 2

	**				F16.7300	EPZEG			C811	GRI 2 NA NA	13.4 7725/2000	
	Destails Desays Water Chiese											
Finorenthene Pyrene Bis(2-cthylheryl)phthalate Di-n-octyl phthalate 2-Methyl-4,6-dinitrophenol Diethyl phthalate Other BNAs	210 140 6 130 20 5,500 NA	1.6 ID 32 ID Not Available Not Available NA	210 140 NLV NLV NLV NLV NLV	210 140 220 400 9,500 1,100,000 NA	2555555	29 29 29 29 29 29 29 29 29 29 29 29 29 2	ND ND ND ND ND ND ND	29 29 29 29 29 29 29 29 29	NE NE NE NE NE NE NE	NE NE NE NE NE NE	NE NE NE NE NE NE	NE NE NE NE NE NE NE NE NE NE NE NE NE N
Arrenic Barium Cadmium Chromium Copper Leed Mercury Nickel Selenium Silver	50 2,800 5 100 (10) 1,000 4 2 100 50 34	150 1,200 4.6 11 (10) 21 29 0.0013 120 5	NLV NLV NLV NLV NLV NLV NLV NLV NLV NLV	43,000 14,000,000 190,000 460,000 (10) 7,400,000 ID 56 74,000,000 970,000	17 EL 1995 E 199	E	25 196 DL ND ND ND ND ND ND ND ND ND ND	4.4 257 DL ND ND 1.2 1.2 ND NE ND ND	44 337 DL ND ND ND 1.1 ND NE ND	NE NE NE NE NE NE NE NE NE	1.6 286 DL ND ND 1.7 3.3 ND NE ND	23 156 DL ND ND 4.4 1 ND NE ND ND
Zinc PCH1 & Perticides (hg/h) Arochlor 1254 Other PCBs Pesticides Cas-1,2-Dichlorosthylene 1,1-Dichlorosthane Vinyl chloride	0.5 0.5 NA	270 0.2 0.2 NA ID ID	NLV 45 45 NA 96,000 1,000,000	110,600,000 3.3 3.3 NA 200,000 2,400,000 570	13 29 29 29 17	NE NE NE NE NE NE NE NE	12 20 20 20 20 20 20 20 20	# 29	ND 0.14 ND ND ND ND ND ND ND ND ND ND ND	NE NE NE NE NE NE NE NE NE NE	688 888	13 20 20 20 23
Toluene Ethylbenzene Xylenes 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Chloroform Other VOCs	790 74 280 63 72 100 NA	140 18 35 ID ID 170 NA	530,000 170,000 190,000 56,000 61,000 28,000 NA	530,000 170,000 190,000 56,000 61,000 150,000 NA	29999999999999999999999999999999999999	NE NE NE NE NE NE NE NE NE NE NE NE NE N	9999999	9999999	9999999	E E E E E E	9999999	<b>555555</b>

- Groundwater sampling was conducted by Malcolm Pimie in February and July 2000.
   Concentrations reported in micrograms per liter (ug/L).
   Criteria taken from Operational Memorandum No. 18, Part 201 Generic Cleanup Criteria and Screening Levels, dated June 7, 2000.
- 4. ID Inadequate data to develop RBSL.
- 5. NLV Hazardous substance is not likely to volstilize under most conditions.
- 6. NLL Chemical is not likely to leach under most soil conditions.
- 7. NA Not applicable. Various cleanup criteria are listed for each of BNA, Pesticide and VOC compounds. However, since detections were not identified except for compounds listed, cleanup criteria were not listed.

  8. NE Not evaluated as part of the assessment activities.

  9. ND Not detected above analytical laboratory method detection levels.

- 10. DL Sample analyzed using a dilution(s).
- 11. Hexavalers chromium used for conservative comparison.

# APPENDIX C COPY OF MDEQ DIVISIBILITY DETERMINATION

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## STATE OF MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY KALAMAZOO DISTRICT OFFICE



March 26, 2002

Revision of 3/18/02 Letter

Mr. Gary Kelterborn Consumers Energy 1945 West Parnall Road Jackson, Michigan 49201-8643

Dear Mr. Kelterborn

SUBJECT: Off-Site Migration of Contamination at former Consumers Energy

Property, 701 East Michigan Avenue and 433 Ampersee Avenue,

Kalamazoo (Kalamazoo County)

Staff of the Department of Environmental Quality, Environmental Response Division (ERD), has reviewed groundwater and soil sampling results from the above referenced properties, and from adjoining, upgradient properties located at 430, 434 and 503 Ampersee Avenue.

The 430, 434 and 503 Ampersee Avenue properties were historically utilized by a tank recycling facility, and were addressed by the Environmental Protection Agency through an emergency removal action in 2001.

Vinyl chloride was detected above regulatory limits in monitoring wells installed at the former Consumers Energy property at 433 Ampersee Avenue. However, based on soil sample analytical results from the property and the former use of the upgradient Ampersee properties, the ERD concludes that the presence of vinyl chloride in groundwater at the 433 Ampersee Avenue location is from an off-site source, and is not attributable to activities associated with the former Consumers Energy property.

Tetrachloroethene was detected in soil samples at two locations on the north (Ampersee Street) parcel above generic residential drinking water cleanup criteria. However, both values were flagged as "estimated or not accurate" by the testing laboratory. Tetrachloroethene was not detected in any groundwater samples. Based on these results and historical property use, the ERD does not consider the presence of tetrachloroethene attributable to activities associated with the former Consumers Energy property.

7953 ADOBE ROAD - KALAMAZOO, MICHIGAN 49009-5028 www.michigan.gov - (816) 567-3500

Mr. Gary Kelterborn

2

March 26, 2002

If you have any questions, comments or concerns, please feel free to contact me at the telephone number below.

Sincerely,

Carol Dreguer

Carol Weaver

**Environmental Response Division** 

Kalamazoo District

Phone: 616-692-3532

FAX:

616-567-9440

Email:

weaverc1@michigan.gov

#### CW/MS

Mr. Chad Howell, City of Kalamazoo

Mr. Marc Hatton, City of Kalamazoo

Mr. Robert Neumann, Consumers Energy

## **EXHIBIT STEAM PLANT-5**



A CMS Energy Company

Environmental & Lab Services 1945 West Parnall Road Jackson, MI 49201-8643 Fax. 517-788-2020 www.consumersenergy.com

February 17, 2003

Carol Weaver
Remediation and Redevelopment Division
Michigan Department of Environmental Quality
Kalamazoo District Office
7953 Adobe Road
Kalamazoo, MI 49009-5026

GROUNDWATER MONITORING REPORT FORMER AMPERSEE & HOTOP ASH STORAGE SITE KALAMAZOO, KALAMAZOO COUNTY

Consumers Energy Company is herein submitting for your review a copy of the "Groundwater Monitoring Report – Kalamazoo Ash" (dated February 14, 2003) for the former Kalamazoo Ash storage site. The enclosed report was prepared by our site consultant, Soil and Materials Engineers(SME), Plymouth, Michigan.

The report addresses groundwater monitoring completed September and December 2002.

The report indicates that all monitored parameters are below analytical method detection limits or Groundwater/Surface Water Interface (GSI) criteria.

A "third" quarter of groundwater samples will be collected the week of March 10, 2003.

If there are any questions or comments concerning the report, please call me on 517-788-0350.

Robert G Neumann PE, Senior Engineer

Project Site Manager

cc GLKelterborn, P-24-608A w/o enclosure Marc Hatton, City of Kalamazoo PBarrese, SME, Plymouth w/o enclosure

#### soil and materials engineers, inc.

43980 Plymouth Oaks Blvd. Plymouth, MI 48170-2584 (734) 454-9900 FAX (734) 454-0629

Kenneth W. Kramer, PE, Chairman

Mark K. Kramer, PE Frank A. Henderson, PG Timothy H. Bedenis, PE Gerald M. Belian, PE Larry P. Jedele, PE Starr D. Kohn, PhD, PE Edward S. Lindow, PE Gerard P. Madej, PE Truman F. Maxwell, CPA Robert C. Rabeler, PE

J. William Coberly, CET Sheryl K. Fountain Chuck A. Gemayel, PE Davie J. Hurlburt, PE Cheryl Kehres-Dietrich, CGWP Michael S. Meddock, PE Timothy J. Mitchell, PE Thomas P. Rozman, PE, CFM John C. Zarzecki, CWI

Patrick G. Barrese, CPG Timothy W. Belcher Brian F. Burke, CPG Paul Bycofski, CT Christopher R. Byrum, PhD, PE Gary A. Docking Michael E. Gase, CWI Julie A. Hartner E. Laney Henson Herbert A. Hoskins, CHMM J. Art Johnson, CET Laurel M. Johnson, PE Jeffery M. Krusinga, PE James M. Less, CIH Mark L. Michener, CSI Michael J. Neuman, PE Thomas M. Peet, PE Rohan W. Perera, PhD, PE Thomas M. Powell Joel W. Rinkel, PE Daniel O. Roeser Larry W. Shook, PE Thomas H. Skotzke R. Scott Steiner, CT Michael J. Thelen, PE

February 14, 2003

Mr. Robert G. Neumann, P.E. Environmental & Technical Services Department Consumers Energy Company 1945 W. Parnall Road, Room P-22-520 Jackson, Michigan 49201

> Groundwater Monitoring Report Kalamazoo Ash Consumers Energy Company Kalamazoo, Michigan SME Project No. KE41177

Dear Mr. Neumann:

RE:

This letter presents the results of groundwater monitoring activities that SME conducted at the above referenced site during September and December 2002. The groundwater monitoring is being conducted on a quarterly basis in accordance with the draft "Report of Remedial Action and Post Remedial Groundwater Monitoring," dated October 4, 2002. The purpose of the quarterly groundwater monitoring is to further evaluate the Groundwater/Surface Water Interface (GSI) exposure pathway for metals with respect to the Kalamazoo River.

#### **SCOPE OF SERVICES**

The scope of services conducted for the groundwater monitoring events is presented below.

1. Gauged groundwater elevations and collected groundwater samples at GSI-1, GSI-2R, GSI-3 and GSI-4 on September 26 and December 10, 2002. Figure No. 1 of Attachment A depicts the locations of the wells at the site.

Groundwater samples were submitted for laboratory analysis of the Michigan 10 Metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver and zinc) and hexavalent chromium. Groundwater samples were also evaluated in the field for pH and specific conductivity.

2. Prepared this summary letter report which includes the following:

KR059B027460



Detroit Bay City Grand Rapids Kalamazoo Lansing Toledo

Consultants in the geosciences, materials, and the environment

Mr. Robert G. Neumann, P.E. Consumers Energy February 14, 2003 Page 2

- a. tabulated depths to groundwater for September 26 and December 10, 2002;
- b. tabulated analytical results for September 26 and December 10, 2002 compared to Part 201 criteria; and,
- c. copies of laboratory analytical test results.

Groundwater sampling procedures, analytical methods and detection limits were consistent with those presented in the draft "Report of Remedial Action and Post Remedial Groundwater Monitoring," dated October 4, 2002. As previously stated, groundwater samples were also evaluated for hexavalent chromium. The analytical method and detection limit for hexavalent chromium were consistent with the Michigan Department of Environmental Quality (MDEQ) Environmental Response Division Operational Memorandum #6, Revision 6, dated January 12, 2001. Purge water collected from monitoring wells was returned to the corresponding well after sampling activities had been completed. Groundwater samples were submitted to Consumers Energy Company's (Consumers Energy's) Chemistry & Material Services Department (C&MSD) in Jackson, Michigan for analysis.

#### RESULTS

#### Depth to Groundwater

Table 1 of Attachment A lists the depths to groundwater gauged at GSI-1 through GSI-4 in September and December 2002.

For September 2002, groundwater was encountered at depths ranging from 2.3 feet (ft.) below top-of-casing (TOC) at GSI-1 to 5.6 ft. below TOC at GSI-2R; while in December 2002, groundwater was encountered at depths equivalent to September 2002, again ranging from 2.3 ft. below TOC at GSI-1 to 5.6 ft. below TOC at GSI-2R.

The direction and horizontal hydraulic gradient of groundwater could not be determined for the September and December 2002 groundwater monitoring events due to the location of the wells relative to each other and the Kalamazoo River. However, previous investigation activities conducted at the site by Malcolm Pirnie, Inc. on behalf of the MDEQ in February 2000 indicated groundwater flow at the Kalamazoo Ash site is to the west towards the Kalamazoo River.

#### **Analytical Results**

Table 2 of Attachment B lists the analytical results for groundwater samples collected from site monitoring wells in September and December 2002. Table 2 also lists the Part 201 Generic Residential and Commercial I Cleanup Criteria for Drinking Water, the Part 201 Cleanup Criteria for GSI, as well as the Rule 57 Final Acute Values (FAVs). Copies of laboratory analytical reports for groundwater samples collected from site monitoring wells in September and December 2002 are presented in Attachment C.

Arsenic, barium, cadmium, chromium (total), hexavalent chromium, copper, lead, mercury, selenium and zinc concentrations were either less than the target detection limits (TDLs) or Part 201 Generic Residential Cleanup Criteria for Drinking Water, Part 201 Cleanup Criteria for GSI and the Rule 57 FAVs for both the September and December 2002 groundwater monitoring events.

Mr. Robert G. Neumann, P.E. Consumers Energy February 14, 2003 Page 3

#### GENERAL

The next round of groundwater monitoring is scheduled for the week of March 10, 2003. If you have any questions or comments concerning this report, please call.

Sincerely,

SOIL AND MATERIALS ENGINEERS, INC.

Patrick G. Barrese, CPG Senior Project Consultant

Attachments:

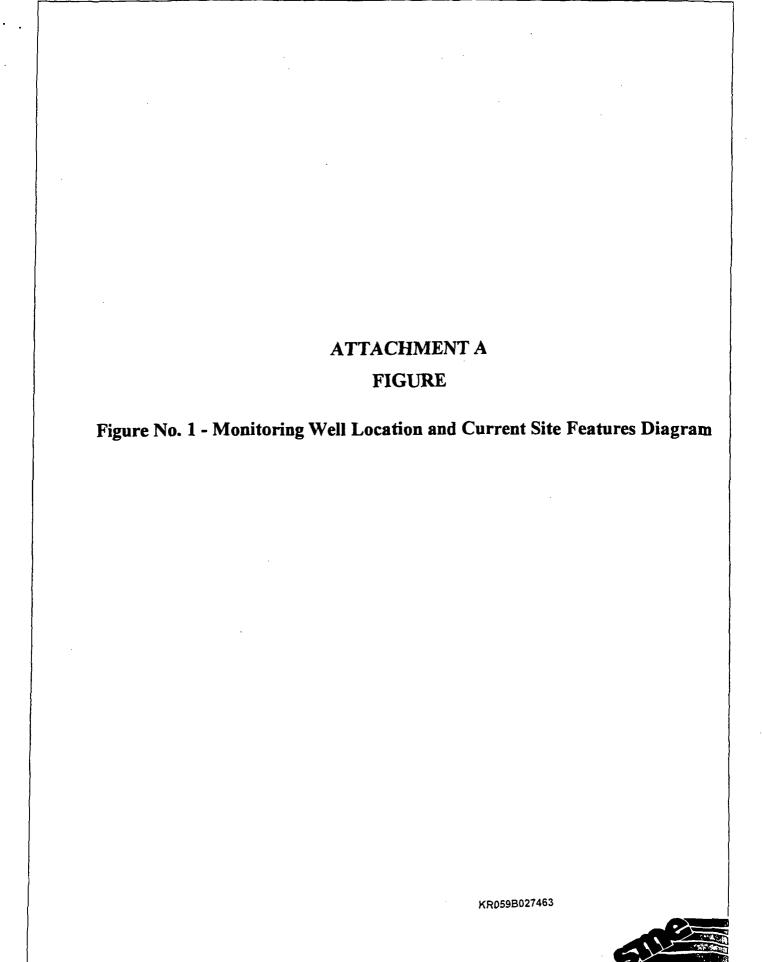
Attachment A: Figure No. 1 - Monitoring Well Location and Current Site Features Diagram

Attachment B: Table 1 - Depth to Groundwater Summary

Table 2 - Groundwater Monitoring Analytical Summary

Attachment C: Laboratory Analytical Reports

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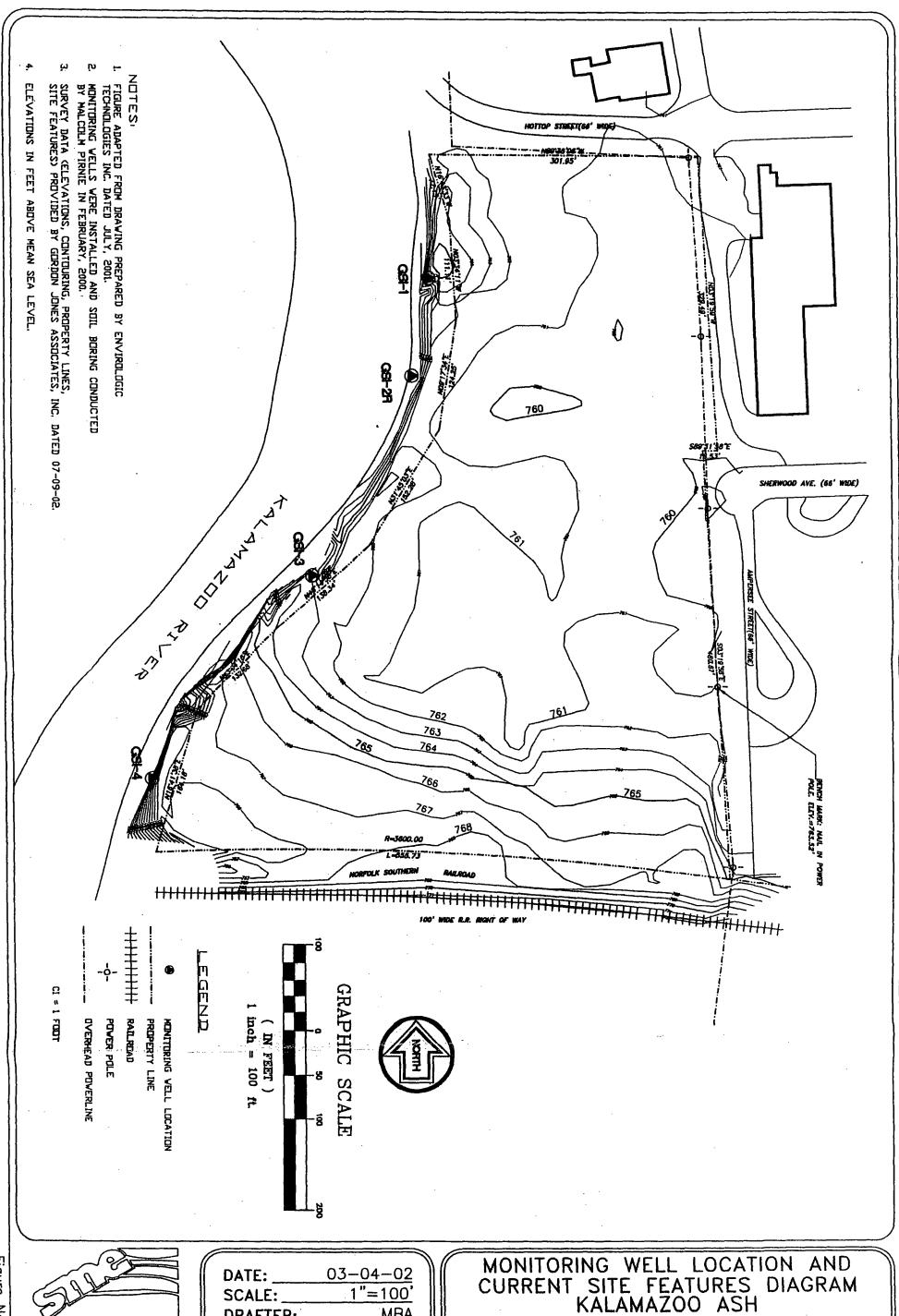


Figure No. 

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CONSUMERS ENERGY

KALAMAZOO, MICHIGAN

MBA

KE 41177

## ATTACHMENT B TABLES

Table 1 – Depth to Groundwater Summary
Table 2 – Groundwater Monitoring Analytical Summary



#### TABLE 1

## DEPTH TO GROUNDWATER SUMMARY KALAMAZOO ASH CONSUMERS ENERGY

SME Project No. KE41177

Page 1 of 1

Well ID	Depth to Water from TOC (ff.)	Depth to Water from TOC (ft.)
GSI-1	2.33	2.30
GSI-2R	5.62	5.64
GSI-3	3.35	3.32
GSI-4	4.69	4.67

Notes:

(1) TOC = Top of Casing.

TABLE 2

#### GROUNDWATER MONITORING ANALYTICAL SUMMARY

#### KALAMAZOO ASH CONSUMERS ENERGY

SME Project No. KE41177

Page 1 of 2

			Date Collected	97.607 197.607 197.607	7681-2R 274.5 9726702	GSI-3 2.3 - 4 9/26/02	GSI-4 3,1 - 4.5 9/26/02
Constituent	Pinal Acres Value  (PAX)	A Collection	Groundwater Surface Unitersace Criteria				
Metals	Rather To an est						arivitat († 14
Arsenic	680	50	150	ND	ND	ND	ND
Barium	7,039	2,000	1,200	360	240	310	180
Cadmium	24	5.0	4.6	ND	ND	ND	ND
Chromium (total)	1,290	100 (5)	160 (5)	ND	ND	ND	ND
Chromium (hexavalent)	32	100	11	ND	ND	ND	ND
Copper	67	1,000	21	ND	ND	ND	ND
Lead	520	4	29	ND	ND	ND	ND
Mercury	2.8	2.0	0.0013	ND	ND	ND	ND
Selenium	120	50	5.0	ND	ND	ND	ND
Silver	1.1	34	0.2	ND	ND	ND	ND
Zinc	535	2,400	270	ND	22	ND	ND

#### Notes:

- 1. Concentrations reported in micrograms per liter (ug/l or ppb).
- 2. FAV taken from draft tabulated Rule 57 Water Quality Values, dated August 10, 2000.
- 3. Part 201 Generic Residential and Commercial I Cleanup Criteria for Drinking Water were taken from the Part 201 Rule 744 Table dated November 2002.
- 4. Part 201 GSI Cleanup Criteria were taken from the Part 201 Rule 744 Table and Rule 750 dated November 2002.
- 5. ND Not detected above target detection level.
- 6. Trivalent chromium used for comparison.
- 7. Shading and bold type indicates analytical results which exceed criteria and the criteria exceeded.

# KR059B02746

### GROUNDWATER MONITORING ANALYTICAL SUMMARY

#### KALAMAZOO ASH CONSUMERS ENERGY

TABLE 2

SME Project No. KE41177

Page 2 of 2

			Well ID Serven Depth (feet) Date Collected	C81-1 1.9 - 1.4 12/10/02	G81-2R 2 - 4.5 12/10/02	GSI-3 2.3 - 4 12/10/02	GSI-4 3.1 - 4.5 12/10/02
Constituent	Final Acute Value (FAV)	Rendential Drinking / Water Sections	Groundwaper/ Suppace Water  Interface  Criteria:				
Metals	E 70 20 20 7 41 7 8						
Arsenic	680	50	150	ND	ND	ND	ND
Barium	7,039	2,000	1,200	320	250	300	180
Cadmium	24	5.0	4.6	ND	ND	ND	ND
Chromium (total)	1,290	100 (5)	160 (5)	ND	ND	5	ND
Chromium (hexavalent)	32	100	11	ND	6	ND	ND
Соррег	67	1,000	21	ND	ND	ND	ND
Lead	520	4	29	ND	ND	ND	ND
Mercury	2.8	2.0	0.0013	ND ND	ND	ND	ND
Selenium	120	50	5.0	ND	ND	ND	ND
Silver	1.1	34	0.2	ND	ND	ND	ND
Zinc	535	2,400	270	ND	19	12	ND

#### Notes:

- 1. Concentrations reported in micrograms per liter (ug/l or ppb).
- 2. FAV taken from draft tabulated Rule 57 Water Quality Values, dated August 10, 2000.
- 3. Part 201 Generic Residential and Commercial I Cleanup Criteria for Drinking Water were taken from the Part 201 Rule 744 Table dated November 2002.
- 4. Part 201 GSI Cleanup Criteria were taken from the Part 201 Rule 744 Table and Rule 750 dated November 2002.
- 5. ND Not detected above target detection level.
- 6. Trivalent chromium used for comparison.
- 7. Shading and bold type indicates analytical results which exceed criteria and the criteria exceeded.

## ATTACHMENT C LABORATORY ANALYTICAL REPORTS



#### **CONSUMERS ENERGY Memorandum**

To: RGNeumann, P-22-520

From: GLCattell, T-251, Jackson

Date: October 23, 2002 RFCD OCT 2 5 2002

Subject: KALAMAZOO ASH

- SME Project # KE41177-07

- Sampling Date of September 26, 2002

File Index: 520217-600-563

CC: Pat Barrese

Soil & Material Engineers 43980 Plymouth Oaks Blvd. Plymouth, MI 48170-9837

CC: GLKelterborn, P24-605A

On September 27, 2002 the Chemistry Section (CHEM) of Laboratory Services received groundwater samples collected at the KALAMAZOO ASH site.

The samples were returned to CHEM for determination of:

<u>Dissolved Michigan-10 Metals</u> <u>Dissolved Chromium (VI)</u>

All determinations were performed by CHEM and analytical results follow for your review.

#### ANALYTICAL METHODS

<u>Sample Handling</u> - Sample collection and handling was conducted in accordance with SW-846 recommendations. All samples were returned to the Chemistry Section (CHEM) of Laboratory Services for analysis.

Unless otherwise indicated, all analytical methods are from SW-846, Test Methods For Evaluating Solid Waste - Physical / Chemical Methods, USEPA.

Dissolved Metals Preparation (Mercury) - Method 7470, Mercury in Liquid Waste.

#### **Metal Analytes**

Analyte	<u>Method</u>
Arsenic	6020
Barium	6020
Cadmium	6020
Chromium (total)	6020
Chromium (VI)	7196
Copper	6020
Lead	6020
Mercury	7470
Selenium	6020
Silver	6020
Zinc	6020

PROJECT IDENTIFICATION	Kalamazoo A		7.07	Project Number	
	- SME Projec			CHEM-02-156	3
	- Sampling D	ate of Septe	mber 26, 2002		
Sample Identification	GSI-1		Sample Identification	GSI-1	
Sample Depth, ft	-		Sample Depth, ft	-	
Sample Type	water		Sample Type	water	
Sample Date	09-26-02		Sample Date	09-26-02	
Received Date	09-27-02		Received Date	09-27-02	
Report Date	10-23-02	j	Report Date	10-23-02	
Percent Solids, %w/w	-		Percent Solids, %w/w	•	
Preservation Date	at collection		Preservation Date / Type	none / none	
Preservation Type	HNO3	j	Analysis Date	09-27-02	
Analysis Dates	10-04-02 & 10	0-15-02	Analyst	pjc	
Analysts	cih & eb			<b>1</b> 75	
Control Number	021563-01		Control Number	021563-01	<del></del>
METALS	ug/L	TDL	METALS	ug/L	TDL
Arsenic - 6020	nd	5	Chromium (VI) - 7196	nd	
Barium - 6020	360	I I			
Cadmium - 6020	nd	0.5	Į		
Chromium (total) - 6020	nd	5			
Copper - 6020	nd	25		1	
ead - 6020	nd	3			
lercury - 7470	nd	0.2			
selenium - 6020	nd	5	}	1	
Silver - 6020	nd	0.5			
Zinc - 6020	nd	10			
letal Results Are Reported As	Dissolved	Dissolved			
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eviewed By		<del></del> _	Date 10/23/02		(-zoo /
-			Metals	GSI-1	

PROJECT IDENTIFICATION	Kalamazoo A - SME Projec		7-07	Project Numb	
	- Sampling D				
Sample Identification	GSI-2		Sample Identification	GSI-2	
Sample Depth, ft	-		Sample Depth, ft	-	
Sample Type	water		Sample Type	water	
Sample Date	09-26-02		Sample Date	09-26-02	
Received Date	09-27-02		Received Date	09-27-02	
Report Date	10-23-02		Report Date	10-23-02	
Percent Solids, %w/w	-	ĺ	Percent Solids, %w/w	-	
Preservation Date	at collection		Preservation Date / Type	none / none	
Preservation Type	HNO3	ĺ	Analysis Date	09-27-02	
Analysis Dates	10-04-02 & 10	)-15-02	Analyst	pjc	
Analysts	clh & eb	-	1		
Control Number	021563-02		Control Number	021563-02	
METALS	ug/L	TDL	METALS	ug/L	TDL
Arsenic - 6020	nd	5	Chromium (VI) - 7196	nd	<u> </u>
Barium - 6020	240				1
Cadmium - 6020	nd	0.5			
Chromium (total) - 6020	nd	5	{		
Copper - 6020	nd	25			
Lead - 6020	nd	3	}		l
Mercury - 7470	nd	0.2		. [	
Selenium - 6020	nd	5			
Silver - 6020	nd	0.5			
Zinc - 6020	22	10		į	
Metal Results Are Reported As	Dissolved	Dissolved			}
·					
			KR059B027473		
NOTES:	TDL = Targe	t Detection	_imit, ug/L (parts-per-billion)		
			ected At TDL		
	1		Date 10/23/02	<u></u>	
Reviewed By			Date		K-zoo Ash
•				GSI-2	-

PROJECT IDENTIFICATION	Kalamazoo A			Project Number			
	- SME Project	t # KE41177	7-07	CHEM-02-1	563		
	- Sampling D	ate of Septe	mber 26, 2002				
Sample Identification	GSI-3		Sample Identification	GSI-3			
Sample identification	G51-5		Sample Identification	431-3			
Sample Depth, ft	-		Sample Depth, ft	-			
Sample Type	water		Sample Type	water			
Sample Date	09-26-02		Sample Date	09-26-02			
Received Date	09-27-02		Received Date	09-27-02			
Report Date	10-23-02		Report Date	10-23-02			
Percent Solids, %w/w			Percent Solids, %w/w	-			
Preservation Date	at collection	i	Preservation Date / Type	none / none			
Preservation Type	HNO3		Analysis Date	09-27-02			
Analysis Dates	10-04-02 & 10	)-15 <b>-</b> 02	Analyst	pjc			
Analysts	clh & eb	ļ	1				
Control Number	021563-03		Control Number	021563-03			
METALS	ug/L	TDL	METALS	ug/L	TDL		
Arsenic - 6020	nd	5	Chromium (VI) - 7196	nd			
Barium - 6020	310						
Cadmium - 6020	nd	0.5	1		ł		
Chromium (total) - 6020	nd	5		-	ŀ		
Copper - 6020	nd	25					
Lead - 6020	nd	3					
Mercury - 7470	nd	0.2					
Selenium - 6020	nd	5					
Silver - 6020	nd	0.5					
Zinc - 6020	nd	10					
Metal Results Are Reported As	Dissolved	Dissolved		·			
	1						
		,					
·							
	ļ						
			DD027474				
			KR059B027474				
		ļ					
IOTES:	TDL = Targe		Limit, ug/L (parts-per-billion) ected At TDL				
				<del></del>	<del></del>		
Reviewed By	u		Date (%)	Data File	K-zoo Ast		
7		<del></del>		GSI-3	-		

PROJECT IDENTIFICATION	Kalamazoo A	sh		Project Numb	er		
	- SME Project	ct # KE4117	CHEM-02-1563				
	- Sampling D	ate of Septe	ember 26, 2002				
Sample Identification	GSI-4		Sample Identification	GSI-4			
Cample Identification	GO -4		Campic racinimation	431-4	•		
Sample Depth, ft	-		Sample Depth, ft	_			
Sample Type	water		Sample Type	water			
Sample Date	09-26-02		Sample Date	09-26-02			
Received Date	09-27-02		Received Date	09-27-02			
Report Date	10-23-02		Report Date	10-23-02			
Percent Solids, %w/w			Percent Solids, %w/w	-			
Preservation Date	at collection		Preservation Date / Type	none / none			
Preservation Type	HNO3		Analysis Date	09-27-02			
Analysis Dates	10-04-02 & 10	2-15-02	Analyst	pjc			
Analysts	ch & eb	-15-02	/ trialyst	Pic			
Control Number	021563-04		Control Number	021563-04			
Control (Variable)	1021000 04		GOLIAGI IVAINISC.	1021000-04			
METALS	ug/L	TDL	METALS	ug/L	TDL		
Arsenic - 6020	nd	5	Chromium (VI) - 7196	nd			
Barium - 6020	180						
Cadmium - 6020	nd	0.5	·				
Chromium (total) - 6020	nd	[ 5			İ		
Copper - 6020	nd	25					
Lead - 6020	nd	3					
Mercury - 7470	nd	0.2					
Selenium - 6020	nd	<b>j</b> 5]					
Silver - 6020	nd	0.5					
Zinc - 6020	nd	10					
Metal Results Are Reported As	Dissolved	Dissolved					
			·				
				]			
			KR059B027475				
NOTES:			Limit, ug/L (parts-per-billion) ected At TDL				
		<del></del>					
Reviewed By	M		Date 10/23/02	Data File	K-zoo Ash		
			· - · · · · · · · · · · · · · · · · · ·	GSI-4	200 /10/		

### **CHAIN OF CUSTODY**

CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

Consumers Energy

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251 FAX (517) 788-2533 PROJECT NUMBER: SAMPLING SITE: LYSIS REQUESTED KE 41177-07 SEND REPORT TO: Pat Barressa SITE SKETCH ATTACHED? CIRCLE ONE: 9/27/02 YES (NO) CE CONTROL # # OF CONTAINERS SAMPLE TIME SAMPLE MATRIX SAMPLE DESCRIPTION / LOCATION REMARKS 02-156301 926 -02 -03 KR059B027476 PATE / TIME RECEIVED BY: (SIGNATURE)

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PATE / TIME RECEIVED BY: (SIGNATURE) DATE / TIME RELINQUISHED BY: (SIGNATURE) RELINQUISHED BY: (SIGNATURE)

# CONSUMERS ENERGY Memorandum JAN 0 9 2003

To:

RGNeumann, P-22-520

From:

GLCattell, T-251, Jackson

Date:

January 07, 2003

Subject:

KALAMAZOO ASH

- SME Project # KE41177-07

- Sampling Date of December 10, 2002

File Index:

520217-600-961

CC:

Pat Barrese

Soil & Material Engineers 43980 Plymouth Oaks Blvd. Plymouth, MI 48170-9837

CC:

GLKelterborn, P24-605A

On December 10, 2002 the Chemistry Section (CHEM) of Laboratory Services received groundwater samples collected at the KALAMAZOO ASH site.

The samples were returned to CHEM for determination of:

<u>Dissolved Michigan-10 Metals</u> <u>Dissolved Chromium (VI)</u>

All determinations were performed by CHEM and analytical results follow for your review.

#### **ANALYTICAL METHODS**

<u>Sample Handling</u> - Sample collection and handling was conducted in accordance with SW-846 recommendations. All samples were returned to the Chemistry Section (CHEM) of Laboratory Services for analysis.

Unless otherwise indicated, all analytical methods are from SW-846, Test Methods For Evaluating Solid Waste - Physical / Chemical Methods, USEPA.

Dissolved Metals Preparation (Mercury) - Method 7470, Mercury in Liquid Waste.

#### Metal Analytes

Analyte	Method
Arsenic	6020
Barium	6020
Cadmium	6020
Chromium (total)	6020
Chromium (VI)	7196
Copper	6020
Lead	6020
Mercury	7470
Selenium	6020
Silver	6020
Zinc	6020

PROJECT IDENTIFICATION	Kalamazoo A			Project Nun	nber
	- SME Project	CHEM-02-1961			
•			mber 10, 2002	0	
Sample Identification	GSI-1		Sample Identification	GSI-1	
Sample Depth, ft	2.30 - 4.82		Sample Depth, ft	2.30 - 4.82	
Sample Type	water		Sample Type	water	
Sample Date	12-10-02		Sample Date	12-10-02	
Received Date	12-10-02		Received Date	12-10-02	
Report Date	02-10-03		Report Date	02-10-03	
Percent Solids, %w/w	-	Ì	Percent Solids, %w/w	-	
Preservation Date / Type	at collection /		Preservation Date / Type	none / none	
Analysis Date / Analyst (Hg)	12-26-02 / clh		Analysis Date	12-11-02	
Analysis Date (others)	01-07-03	-	Analyst	pjc	
Analyst (others)	eb				
Control Number	021961-01		Control Number	021961-01	
METALS	ug/L	TDL	DISSOLVED METAL	ug/L	TDL
Arsenic - 6020	nd	5	Chromium (VI) - 7196	nd	1 100
Barium - 6020	320	100	Cincinati (VI) 7 100	110	
Cadmium - 6020	nd	0.5	·	.	
Chromium (total) - 6020	nd	5			l
Copper - 6020	nd	25			
Lead - 6020	nd	3	·	İ	
Mercury - 7470	nd	0.2			
Selenium - 6020 / 7740	nd	5			
Silver - 6020	nd	0.5			
Zinc - 6020	nd	10			
Metal Results Are Reported As	Dissolved	Dissolved			
Hetal Fleduke Are Heported As	Diodottod	Disdoived			
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OTES:			Limit, ug/L (parts-per-billion)	 KR059B0	)27479
	nd = Param	eter Not Det	ected At TDL		<del>-</del>
eviewed By	V.		Date 01-6-3	Data File	K-zoo As
				GSI-1	2.30 - 4.8

PROJECT IDENTIFICATION	Kalamazoo As - SME Projec - Sampling Da	t # KE41177		mber 1961	
Sample Identification	GSI-2		Sample Identification	GSI-2	<del></del>
Sample Depth, ft	5.64 - 7.66		Sample Depth, ft	5.64 - 7.66	
Sample Type	water	į	Sample Type	water	
Sample Date	12-10-02 12-10-02		Sample Date Received Date	12-10-02 12-10-02	
Received Date	02-10-03		Report Date	02-10-03	
Report Date Percent Solids, %w/w	-	l	Percent Solids, %w/w	-	
Preservation Date / Type	at collection / I	HNO3	Preservation Date / T		•
Analysis Date / Analyst (Hg)	12-26-02 / clh	i i	Analysis Date	12-11-02	9
Analysis Date (others)	01-07-03 & 01	i i	Analyst	pjc	
Analyst (others)	pic & eb	_, 50	· · · · · · · · · · · · · · · · · · · ·	Pic	
Control Number	021961-02		Control Number	021961-02	
METALS	ug/L	TDL	DISSOLVED METAL	ug/L	TDL
Arsenic - 6020	nd	5	Chromium (VI) - 7196	nd nd	5
Barlum - 6020	250	100 0.5			
Cadmium - 6020	nd 6	5			
Chromium (total) - 6020 Copper - 6020	nd	25			
Lead - 6020	nd	3	,		
Mercury - 7470	nd	0.2	}		- 1
Selenium - 6020 / 7740	nd	5			
Silver - 6020	nd	0.5			
Zinc - 6020	19	10			
Metal Results Are Reported As	Dissolved	Dissolved			
·	1				
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NOTES:			Limit, ug/L (parts-per-bil ected At TDL	llion) KR059E	3027480
Reviewed By			Date 01-10-	Data File	K-zoo Ast
7				GSI-2	5.64 - 7.66

PROJECT IDENTIFICATION	Kalamazoo Ash - SME Project # KE41177 Sampling Date of Decem		7-07 mber 10, 2002	Project Number CHEM-02-1961		
Sample Identification	GSI-3		Sample Identification	GSI-3	·	
,		ļ				
Sample Depth, ft	3.32 - 5.32		Sample Depth, ft	3.32 - 5.32		
Sample Type	water	·	Sample Type	water		
Sample Date	12-10-02	ļ	Sample Date	12-10-02		
Received Date	12-10-02		Received Date	12-10-02		
Report Date	02-10-03		Report Date	02-10-03	•	
Percent Solids, %w/w	-	ļ	Percent Solids, %w/w			
Preservation Date / Type	at collection / I	HNO3	Preservation Date / Type	none / none	)	
Analysis Date / Analyst (Hg)	12-26-02 / clh		Analysis Date	12-11-02		
Analysis Date (others)	01-07-03		Analyst	pjc		
Analyst (others)	eb	İ				
Control Number	021961-03		Control Number	021961-03	<del></del>	
METALS	ug/L	TDL	DISSOLVED METAL	ug/L	TDL	
Arsenic - 6020	nd	5	Chromium (VI) - 7196	nd		
Barium - 6020 Cadmium - 6020	300	100		.	ĺ	
Chromium (total) - 6020	nd 5	0.5 5	1	İ		
Copper - 6020	nd	25		į	l	
Lead - 6020	nd	3		}		
Mercury - 7470	nd	0.2		Ţ		
Selenium - 6020 / 7740	nd '	5	·			
Silver - 6020	nd	0.5				
Zinc - 6020	12	10			]	
Metal Results Are Reported As		Dissolved			]	
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NOTES:			imit, ug/L (parts-per-billion)		<u> </u>	
	nd = Parame	ner not Deti	ected At TDL			
	<u> </u>				······································	
Reviewed By Mu			Date	Data File	K-zoo Ast	
7				GSI-3	3.32 - 5.32	

PROJECT IDENTIFICATION	Kalamazoo A - SME Project - Sampling D	t # KE41177	7-07 nber 10, 2002		Project Number CHEM-02-1961		
Sample Identification	GSI-4	-	Sample Identification		IGSI-4		
Sample identification	GOI-4		Sample Identification	VI I	GS1-4		
Sample Depth, ft	4.67 - 5.77		Sample Depth, ft		4.67 - 5.77		
Sample Type	water		Sample Type		water		
Sample Date	12-10-02		Sample Date		12-10-02		
Received Date	12-10-02		Received Date		12-10-02		
Report Date	02-10-03		Report Date		<b>.</b>		
	02-10-03				02-10-03		
Percent Solids, %w/w	-	LINIOO	Percent Solids, %w/		•		
Preservation Date / Type	at collection /		Preservation Date /	ı ype	none / none		
Analysis Date / Analyst (Hg)	12-26-02 / clh		Analysis Date	•	12-11-02		
Analysis Date (others)	01-07-03	}	Analyst		pjc		
Analyst (others)	eb	-					
Control Number	021961-04		Control Number		021961-04		
METALS	ug/L	TDL	DISSOLVED METAL		ug/L	TDL	
Arsenic - 6020	nd	. 5	Chromium (VI) - 719	6	nd	1	
Barium - 6020	180						
Cadmium - 6020	nd	0.5					
Chromium (total) - 6020	nd	5				İ	
Copper - 6020	nd	25					
Lead - 6020	nd	3				-	
Mercury - 7470	nd	0.2					
Selenium - 6020 / 7740	nd	5				1	
Silver - 6020	nd	0.5					
Zinc - 6020	nd	10				ĺ	
Metal Results Are Reported As	Dissolved	Dissolved					
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	{	1					
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OTES:			l imit, ug/L (parts-per-b ected At TDL	illion)			
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Reviewed By			Date Or 10	<b>0</b> 3	Data File	K-zoo As	

### **CHAIN OF CUSTODY**

CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

CONSUMERS EN	ergy									ζį		,					
		135 WES	T TRAIL	L ST., JACKSO	ON, MI 4920	1 •	(517)	788-1251	•	SA	X (5	17) 7	<b>788</b> -2	2533	į	ı	1
SAMPLING SITE:				PROJECT NUMBER:					18	10		EQUES			25	0	1
Kakuna	1200	Ash	1	KE4117	7-07	•		• •	Di	3	.1315 N	EUUES			SESI	END REPO	
SAMPLING TEAM:		•		DATE SHIPPED:		SITE	E SKETCH A			4				1	97	1 John I	
لاب		<del></del>		12/10/2	02		YES /		15	Hich				PH	ONE:	1341	154-99
CE CONTROL #	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	SAMPLE DESCR	RIPTION / LOCATION		DEPTH	# OF CONTAINERS	13	0	· [	- 1	1 1			REMAR	KS
02-1961-011	2/10		W	651-	- [	2	3048	2	X	义					•		
-02				G51	-2	5	104-7-64	· 2	X	1							
-03				651	-3	3,	32 5.3	22	K								
1-04	W		V	651.	-4	.7	167-5	77)	V	5							
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### **EXHIBIT STEAM PLANT-6**

PAGE 1

# ENVIRONMENTAL DEPARTMENT MANIFESTED WASTE TRACKING SYSTEM WASTE SHIPMENTS FROM 010184 TO 081303 REPORT NO. 22

FACILITY TRANSPORTER	TSDF	DESCRIPTION	WAS. NUMB N/I		MANIFEST DOC DATE NUMBER NUM SHIPPED
KALAMAZOO ASH SITE TERRA CONTRACTING LLC TERRA CONTRACTING LLC TERRA CONTRACTING LLC TERRA CONTRACTING LLC SQS,INC	CROWN VANTAGE LF	MISC. SOLID, NOS	N/A	57922 Y	MI8286135 51154 07/30/0
	CROWN VANTAGE LF	MISC. SOLID, NOS	N/A	57922 Y	MI8286135 51154 07/30/0
	CROWN VANTAGE LF	MISC. SOLID, NOS	N/A	57922 Y	MI8286135 51154 07/30/0
	CROWN VANTAGE LF	MISC. SOLID, NOS	N/A	38743 Y	MI8286135 51154 07/30/0
	MICH DISPOSAL WTP (EQ)	HAZARDOUS WASTE, LIQUID, NOS	D006	140 G	MI8470929 51345 08/06/0

KR059B027485

#### WASTE MANAGEMENT DIVISION MICHIGAN DEPARTMENT OF **ENVIRONMENTAL QUALITY**

DO NOT WRITE IN THIS SPACE ATT. DIS. 🗆 REJ. PR.□ Required under authority of Part 111 and Part 121 of Act 451, 1994, as amonded.

Failure to file may subject you to criminal and/or civil penaltics under Sections 324.11161 or 324.12116 MCL.

Ā		UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator's MIK96911	US EPA ID No.	Manifest Document No.	2. Page			the shaded crace ired by Foderal		
	3.	Generator's Name and Malling Address	1 FILESOFIE	0032	1.21.1.24	A Spi	Manifest Co.	in on	AMERICAN STREET		
		Consumers Energy Kalama:					Greaters I		A Service Services		
l	4	1945 W Parnall Rd. Jackson Generator's Phone (517) 7880	-		umann	of the appeal of the state of the state of the state of					
	5.	Transporter 1 Company Name		6. US EPA ID			cell a recuire				
l		Terra Contracting, LLC		TERRACONTILC		D. Tran	speriers Prop	269	Projection 1		
I	7.	Transporter 2 Company Name		8. US EPÀ ID N	Number	E. Siet	Vapaponar	ID.	sale arrangement of the same		
I	0	Designated Facility Name and Site Address	ue	10. US EPA ID N		C Risi	aparere Mar Feelina (C	The same	der Addit of the profitor		
	-	Crown Vantage Landfill			•••••	1	Telegraphical	والكاديات	AND PURE TO STATE		
		Parchment, MI 49004	•	A			ity's Phone				
				CROWNVANTLF		Ala no contrata					
	11.	. US DOT Description (including Proper Shi		zard Class, and	12. Conti	iners	13. Total	14. Unit	T. Waste		
l		HM ID NUMBE	:n/.		999	Туре	Ouantity 57, 922	Wt/Vol	Deposits in the		
	8.	Misc. Solids, N.O.S.,N	N/A,N/A,N/A	A	3665		212509	Y	MA		
	b.	600			000	27		v			
l		Mièc. Solide, N.C	3.3., N/#,	, N/A, N/A	999	81	57,922	Y	ich A America		
	C.	(S)			0.00			4	Tarth shall ineff		
		Misc. Solids, N.O.S	s., N/A, r	VIA, NIA	444	OT S	57,722	T	N/A		
	d.	<b>3</b>			118	ر اسورا	2 9 7 4 5	ارا	NIA		
		misc. Solids, N.O	.s., N/A,	N/A,N/A	660	-	38,743	7	N		
		site address 433 Ampers	uce memo di monto kalami	Mispating apt	ଅନ୍ୟୁକ୍ତ କଥାଚନ୍ତି । ଜଣ୍ଡ ନି	Per Services	The last of the second of the last of the	A THE SE			
	15.	Special Handling Instructions and Addition	nal Information		end accurately dear	ribed abo	ve by proper ship	ping neg	ne and are classified		
		packed, marked, and labeled, and are in all respect if I am a large quantity generator, I certify that to be economically practicable and that I have present and future threat to human health and generation and select the best waste management	ns in proper conditi t i have a program a selected the prec d the environment	ion for transport by highwa n in piece to reduce the sticable method of treatm ; OR; if I am a small qui	ly according to appli volume and toxicity lent, storage, or di antity generator, i i	cable inter of waste sposal cur	national and national section is a section of the contract of	onal gov a degrad to me v	emment regulations.  I have determined which minimizes the		
ŀ		Printed/Typed Name		Signature	1/1/				Month Day Year		
		Robert G Neumann		1 de la	TIME				7 10 10 15 10 0		
		Transporter 1 Acknowledgement of Receip Printed/Typed Name	t of Materials	Signature			<del></del>		Date		
		Steve Taplin OBO 7	Cerra LLC					ľ	Month Day Year		
	18.	Transporter 2 Acknowledgement of Receip					·		Date		
-					•				Laue		
		Printed/Typed Name	.,-	Signature	·	_			Month Day Year		
		Printed/Typed Name Discrepancy Indication Space		Signature			KR059E	L	Month Day Year		
	19.	Discrepancy Indication Space						L	Month Day Year		
	19.		receipt of hazard		t by this manifest	except e		L	Month Day Year		
	19.	Discrepancy Indication Space Facility Owner or Operator: Certification of item 19.	receipt of hazer	dous materials covered	by this manifest	except e		302748	Month Day Year		
L	19.	Discrepancy Indication Space Facility Owner or Operator: Certification of	receipt of hazard		f by this manifest	except		302748	Month Day Year		

#### WASTE MANAGEMENT DIVISION MICHIGAN DEPARTMENT OF **ENVIRONMENTAL QUALITY**

#### DO NOT WRITE IN THIS SPACE

ATT. □ DIS. □ REJ. PR. 🗆 Failure to file may subject you to oriminal and/or civil penalties under Sections 324.11151 or 324.12116 MCL.

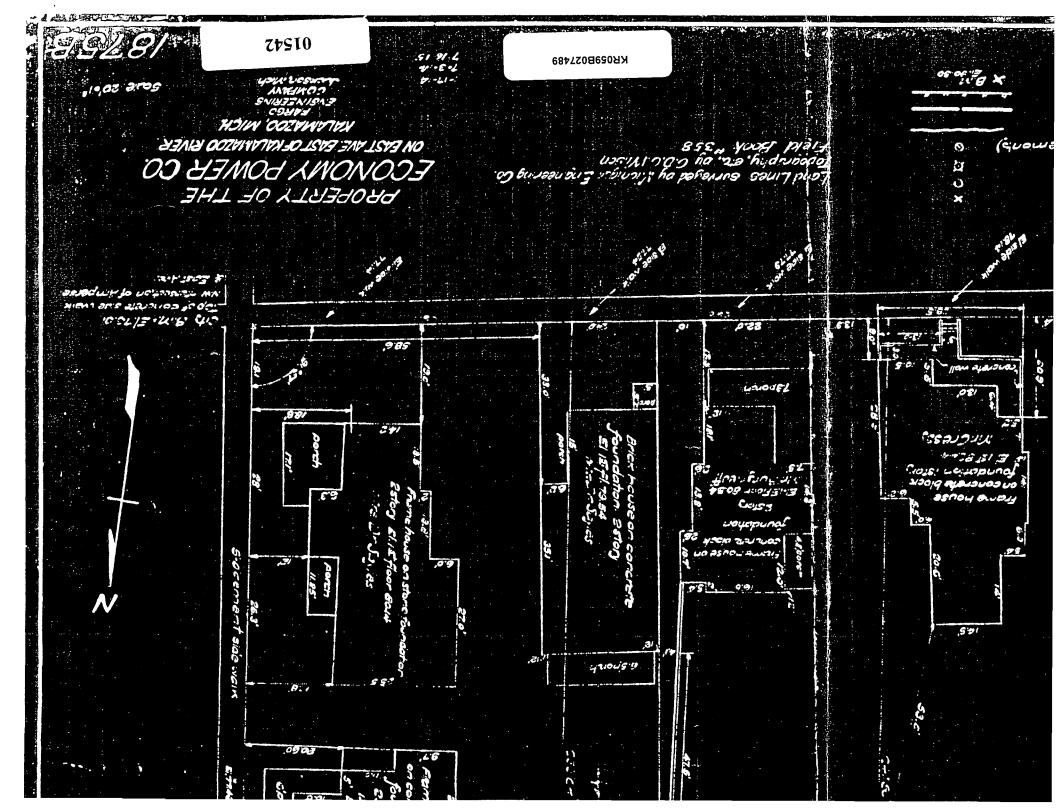
Part 121 of Act 451, 1994, as amended.

Please print or type.					F	orm Approved. OM	B No. 2050	-0039	
WA	ORM HAZARDOUS ASTE MANIFEST	1. Generator's US EF	PA ID No. <b>9118652</b>	Manifest Document No. \$1345	2. Pag	,		n the shaded areas ed by Federal law.	
	PARNALL ROAD	LAMAZOO ASE	SITE			te Manifest Docum II 8470 Le Generators ID	925	ber	
4. Generator's Pho	NN		et vistorija (17. denjara 19. denjar Referensistenska se objekt						
5. Transporter 1 C		6	R G NEUMANN 6. US EPA ID Number MIR 000020719			C. State Transporters ID			
SQS, INC	<del></del>	<del></del>				D. Transporter's Phone 734 459-3800			
7. Transporter 2 C	ompany Name	8 J	8. US EPA ID Number			E. State Transporters ID  F. Transporters Phone			
	Hity Name and Site Address AN DISPOSAL WTP (KQ)		10. US EPA ID Number			G. State Facility's ID			
49350 N I BKLLKV	[-94 SKRVICK DR. ILLE 1MI 4811]	1   <b>N</b>							
	OOT Description (including Proper ID NUMBE		rd Class, and 12. Conta			13.	14.	1. Waste	
нм	ID NUMBEI	R).		No.	Туре	Total Quantity	Unit Wt/Vol	No.	
X (EP/	HAZARDOUS WASTE, 1 A TOXICITY, D006, D008 MIUM)			003	<b>M</b>	× 140	G	<b>D</b> 90\$	
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<b>2.</b>	,							The state of the s	
1.								1995   1995   1996 1996   1996   1996   1996   1996   1996   1996   1996   1996   1996   1996   1996   1996   1996   1996   1996	
LAB#02-09 RBA1177-07 SITE ADDRI	Dions for Materials Listed Above 51-1,2 TANK #1 CONTI	JORAS DETIG	I BLACK SLU	DCH WATER	DAR.		Alternation of the control of the co	K Handling Codes	
5. Special Handling APPROVAL	g instructions and Additional Infor	mation				cy Contact: 1			
classified, packe regulations. If I determined to be the present and	CERTIFICATION: I hereby declard, marked, and labeled, and are in am a large quantity generator, I e economically practicable and the future threat to human health ar select the best waste management.	all respects in proper certify that I have a p at I have selected the p and the environment: O	condition for transport b rogram in place to red practicable method of tr R: If I am a small qual	y highway accordin uce the volume ar eatment storage, o hitiv generator. I he	g to appi nd toxicit r disposi	licable internationa y of waste genera al currently availat	and nati sted to the ole to me	onal government le degree I have which minimizes	
Printed/Typed Name 🗸			Signature X					Month Day Year	
Coshk	21 Q /VUVA	MANN	1 1700	1070	den			0801602	
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3 Transporter 2 Ack	knowledgment of Receipt of Mater	ials						Date	
Printed/Typed No	ame		Signature					Month Day Year	
3. Discrepancy Indi	cation Space		<u></u>		<del></del>	KR059	B02748	7	
). Facility Owner or	Operator: Certification of receipt of	of hazardous materials	covered by this manife	st except as noted	in Item 1	19.			
			· · · · · · · · · · · · · · · · · · ·					Date	
Printed/Typed Name			Signature					Month Day Year	
							- 1		

FACILITY

To be mailed by Generator to:

### **EXHIBIT STEAM PLANT-7**



### **EXHIBIT STEAM PLANT-8**

